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Literature Review on *Gonystylus* spp. other than *Gonystylus bancanus*: Botany, Ecology and Potency



Ministry of Forestry
Forestry Research and Development Agency
in Cooperation with ITTO-CITES Project
Bogor, 2009



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Activity Document 3 “Exploratory Assessment on the Population Distribution and Potential Uses of non-*Gonystylus bancanus* Species in Indonesia”

Activity 1.1.1

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PREFACE

This review brings together as much as possible data on *Gonystylus* species other than *G. bancanus* from various places and institutions for addressing the gap in our knowledge about the taxa that included in CITES Appendix II. The additional knowledge on *Gonystylus* species other than *G. bancanus* can be used for enhancing institutional capacity in CITES implementation, which is one of the objectives of ITTO-CITES Indonesia's work Programme for 2008.

During this review, several facts have been encountered as follows:

- The data availability of non-*Gonystylus bancanus* species is extremely limited compared to the enormous data of *G. bancanus*. Much of the collected digital data and printed materials are only about taxonomy, ecology and distribution of the species. Data on potential uses of non-*Gonystylus bancanus* species and its population and growing stock are very rare or unavailable.
- All herbaria databases were developed based on the *Gonystylus* specimens collected before 1980's and only few specimens in the database that have been collected after 1980's. This condition shows the urgent for new field collection if we would like to obtain the most recent population distribution status.
- Observation on specimens and specimen's databases showed a significant number of unidentified *Gonystylus* species (still labeled as *Gonystylus* sp.). It is explained that such of condition is caused by a non-user friendly identification keys or in other words, the available identification keys are not easy to use. This situation increases the number of unidentified *Gonystylus* specimens.

However, under those limited circumscription, this review aims to provide a preliminary data about biological, ecological and potential aspects of *Gonystylus* species other than *G. bancanus* that have been heavily studied and traded. Review activities across a wide range of topics on *Gonystylus* spp. biology, ecology and potency and other issues of current concern, will make this report valuable for opening our limited knowledge as well as triggering our concern on the taxa.

Finally, we would like to thank all parties that have been contributed to the review process and to the completion of this report.

The Team

ACKNOWLEDGMENT

One of former colleague from Australia said that “all good things must come to an end”, and now after two months struggling, it is time for the Review team leader to acknowledge (on behalf of all team members) all of the institutions and to the persons of those who have patiently and generously assisted this project to completion.

Foremost, we wish to express my gratitude to the International Timber Trade Organization (ITTO) for providing funding for the team, in the duration of the project, and to the Project Coordinator, Ir. Tajudin E. Komar, M.Sc. and his staff for providing an extra guidance during the work.

We also thank the numbers of people and institutions (including herbaria) who were contributed material as well as sharing database and data from specimens for this review; i.e. Dr. Dr. Kade Sidiyasa (WAN, Samboja, East Kalimantan), Dr. Eko Baroto Walujo (BO, Cibinong, West Java), Dra. Marfu'ah, MP (BZF, Bogor, West Java), Dr. Campbell O. Webb (Arnold Arboretum Harvard), Global Biodiversity Information Facilities (GBIF), Species 2000, and TROPICOS.

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Authors

EXECUTIVE SUMMARY

The genus *Gonystylus*, consisting of 29 species and 1 variety that distributed throughout the Malesian area (including Indonesia) with the majority of species found in Borneo. Several species are commercially traded (CITES 2004). Fifteen species in the genus, including *G. bancanus*, are classified as vulnerable in the IUCN's Red List of Threatened Species due to observed, inferred or projected habitat loss and over-exploitation. Following this circumscription, a literature review on biology, ecology and potential uses of *Gonystylus* species other than *G. bancanus* have been conducted.

The results of the review shows that flowering season for *Gonystylus* species is vary between February-March as well as May to October. The flowering and fruiting periods of ramin in Sumatera occur between August and October, although ramin trees sometimes produce flower and fruit in May. Meanwhile in Kalimantan, flowering and fruiting periods of ramin occur between January-May. However, the knowledge on flower biology and pollination syndrome of genus *Gonystylus* is still lacking. Thus, further studies are very crucial to be conducted.

Habitat preference of *Gonystylus* species ranged from primary non-inundated rainforest at low and medium elevations to 1500 m. It is associated with different tree species as reported by many authors. In most habitats, ramin is principally associated with *Shorea albida*, *Dactylocladus stenostachys*, *Dyera lowii*, *Cratoxylum arborescens*, *Palaquium* spp., and *Calophyllum* spp. The species are distributed throughout the Malesian with the vast majority of species is found on Borneo. Distribution's exception occurs in Central and East Java and the Lesser Sunda Islands, although, a single specimen of *G. macrophyllum* from Flores was found during the review. *Gonystylus* distribution continues eastward towards the Solomon Islands, Nicobar and Fiji. The distribution trends show the decreasing number of species towards eastern part of Malesian region. Based on the specimen distribution data, a series of distribution map are provided of which West and East Kalimantan are recommended as the main targeted areas for further ground and stock survey following by other potential areas.

The slow natural regeneration capability has been recorded for *Gonystylus* from the literatures as well as from direct tree diameter measurement in the field. Tree diameter only increased 3 cm since 12 years ago. The current circumscription must be considered in the future development of conservation efforts and in the sustainable use and trade for *Gonystylus* species. Despite this slow growth, ramin whitish timber is highly prized and popular for various wood-work and wood craft. Several *Gonystylus* species also produce non-timber forest products such as medicine, poison and incense that are valuable for the local people income. Based on the review's finding and the limited data during the study, several recommendations have been proposed.

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I. INTRODUCTION

1.1. Background

The genus *Gonystylus*, consisting of about 30 species, is distributed throughout the Malesian area (Indonesia, Malaysia, the Philippines, Papua New Guinea, Singapore and Brunei Darussalam) with the majority of species found in Borneo. Six species (*Gonystylus affinis*, *G. bancanus*, *G. forbesii*, *G. macrophyllus*, *G. maingayi* and *G. velutinus*) are known to be commercially valuable, of which *G. bancanus* is the most heavily traded (CITES 2004).

Fifteen species in the genus, including *G. bancanus*, are classified as vulnerable in the IUCN's Red List of Threatened Species due to observed, inferred or projected habitat loss and over-exploitation. Logging-both selective logging and clear-cutting is recognized as the major threat to these species (IUCN 2004 and 2008). As a result of over-exploitation, ramin has become scarce throughout most of its original range. Excessive logging and destruction of peat swamps have led to commercial extinction in several areas such as in Peninsular Malaysia and Sarawak.

Populations of *Gonystylus* throughout Indonesia have also declined due to over-exploitation (Soehartono and Mardiasuti 2002). This decline is evident in Indonesia's annual ramin production, which fell from more than 665,000 m³ in 1994 to just 131,000 m³ in 2000, a decline of more than 80% in 6 years. Even at these levels, Indonesia's ramin harvest in 2000 far exceeded the annual allowable cut of 24,000 m³ authorized by the Ministry of Forestry. This decline is mainly due to the naturally slow regeneration process of ramin, thus its natural populations have yet to recover. Much of Indonesia's remaining ramin is found in national parks and protected areas that provide vital habitat for many other threatened species, including the orangutan and Sumatran tiger (both on Appendix I). Therefore, conservation efforts are urgently required and several are still on going to support sustainable use of ramin.

Following the conservation efforts, off those more than 30 species of *Gonystylus* occur in Malesian Region including Indonesia, only *Gonystylus bancanus* has been widely explored for its biological, ecological and economical status. Knowledge on other species within the Genus is still extremely limited especially on many aspects, such as biology, ecology and

their potential uses although *Gonystylus* species in Indonesia already included in Appendix III (2001) and up-listed in Appendix II (2004) of the Convention on International Trade of Endangered Species of Wild Flora and Fauna (CITES). The circumscription of insufficient information on biology, ecology and their potential of *Gonystylus* species other than *G. bancanus* have created impediments for their conservation, artificial propagation as well as their sustainable use. Therefore, a thorough review is utterly required for *Gonystylus* species other than *G. bancanus* in Indonesia in order to meet CITES regulation.

1.2. Objectives

The general objective of this review is to contribute to the exploratory assessment on the population distribution and potential uses of non-*Gonystylus bancanus* species in Indonesia. Meanwhile, the specific objective of this review is to provide a preliminary or basic data on biology, ecology and uses of non-*Gonystylus bancanus* species that is useful for the conservation efforts and the prevention of further loss of *Gonystylus* species in Indonesia and for enhancing institutional capacity in CITES implementation.

1.3. Methodology

The activity 1.1 of the project is mainly focused to the data collecting of the biological and taxonomical, habit and habitat, distribution and potential aspects of non-*Gonystylus bancanus* species. The limited amount of time, data types and data sources availability have influenced the structure and the composition of team members as well as the amount of data gathered.

The review team comprises of 3 researchers from Research Centre for Biology, Indonesian Institute of Sciences (LIPI) and 3 researchers from the Centre for Forest and Nature Conservation Research and Development (P3HKA). This team also assisted by a senior librarian and a treasurer.

The data collecting process_has been conducted through literature study, internet and worldwide on-line database searching and downloading, herbarium specimens study and resource person interviews (in the field and in

the related institutions). Thus, data obtained could be categorized into printed and digital publications, specimens and interview notes and digital data from databases. The member of the team visited various herbaria for the literature and specimens studies_such as Herbarium Bogoriense (BO), Herbarium Wanariset (WAN) and Herbarium Forest Research and Development Center and Nature Conservation (BZF) (figure 1).



Figure 1.
Mr. Bugris Yafid and
Ms. Titi Kalima observed
herbarium specimens
and recorded all
associated data

The team also visited a range of libraries such as library of Bogor Agricultural Institute (IPB), University of Indonesia (UI), Forest Research and Development Center and Nature Conservation (P3HKA), SEAMEO-BIOTROP, Bogor Bibliotheca (BB), Wetland Indonesia, CIFOR, National Library, Department of Agriculture, FORDA, and others in the duration of the project (figure 2).



Figure 2.
Mr. Sutiyono studies references in library and record all associated data as well as obtained printed materials

In adjunct to the literature study, an interview to Dr. Campbell O. Webb and rapid field survey has been conducted for seven days (29 January to 4 February 2009) at Resort Panti, Gunung Palung National Park, West Kalimantan (**figure 3**) to obtain rough estimation of *Gonystylus* species growth rate through bole diameter measurement. The bole diameter measurements resulted from the previous ecological study by scientists from the Arnold Arboretum, Harvard University, 15-years ago was used as field reference.



Figure 3.
Dr. Teguh Triono (second from right) team leader, with field team at Gunung Palung National Park, West Kalimantan for rapid field survey on *Gonystylus* spp.

Following the rapid survey, an interview and discussion has also been conducted with another resource person. Resource person is a person that has more knowledge about biological and taxonomical, habit and habitat, distribution and potential uses aspects of non-*Gonystylus bancanus* species. Interviewed with Dr. Kade Sidiyasa has been conducted in Herbarium Wanariset Samboja, East Kalimantan 2-5 March 2009 (see figure 4).



Figure 4.
Ms. Titi Kalima
(wearing veil)
interviewed Dr. Kade
Sidiyasa (sitting in
front) about
Gonystylus species
distribution in
Kalimantan

After a series of data collecting works, one fact and one impediment have been encountered. These fact and impediment are:

1. The data availability of non-*Gonystylus bancanus* species is extremely limited compare to the enormous data of *G. bancanus*. Much of the collected digital data and printed materials are about taxonomy, ecology and distribution of the species. Data on potential uses of non-*Gonystylus bancanus* species and its population and growing stock are very few or unavailable.
2. All herbaria databases were developed based on the *Gonystylus* specimens collected before 1980's and only few specimens in the database that have been collected after 1980's. This condition shows the urgent for new field collection if we would like to obtain the real recent population distribution status. The age of the data became main

consideration of the team because this data need to be scrutinized before it could be plotted onto distribution map. Under limited time, we decided to present these specimen data in table format in the appendices.

Under these impediment and limitations, data and information about non-*Gonystylus bancanus* species collected in the duration of the project (Activity 1.1) are described in the following sections.

II. BOTANICAL INFORMATION

2.1. Taxonomy of Genus and Selected Species

2.1.1. Characteristic of the Genus

Gonytylus is a member of sub-family Gonystyloidea, family Thymelaeaceae and the order of Myrtales (Myrtiflorae). Sub-family Gonystyloideae is characterized by its leaves that usually with translucent gland dots, flower with short tube (petals usually 7-40; inserted at base of tube; stamens 8-80 with horseshoe-shaped anthers, ovary chambers that usually 3-5, style thread-like and small stigma) and a capsule type fruit (Whitmore 1983).

The genus *Gonystylus* in Malesia consists of 29 species and 1 variety (Shaw 1953). Species-species in genus *Gonystylus* are distributed throughout the Malesian area. Diagnostic characters of this genus as follows:

Small to medium-sized trees, up to 42 m tall, occasionally shrubs; bole cylindrical, alignment, straight, branchless for up to 21 m and up to 60(-120) cm in diameter, buttresses are thick if present, sometimes fluted at base; bark surface smooth to cracked, shallowly fissured or scaly, dull grey to red-brown or dark brown, occasionally with white patches, inner bark yellow, brown, pink or orange, laminated or fibrous, with glistening slightly irritating fibres on the cut surface; twigs striate, black or chocolate brown, pendulous, sometimes puberulous-velutinous when young but glabrescent. **Leaves** alternate, simple and entire, papery to thick-leathery, often sparsely hirsute below, especially on the midrib; petiole short glabrous to velutinous, pellucid-punctate; stipules absent. **Inflorescence** usually terminal, paniculate, few-branched with short lateral branches; bracts minute, very early caducous. **Flower** bisexual, actinomorphic, long-pedicelled; calyx more or less cupular, divided to about 1/4—1/3 in 5 petaloid thick tough lobes, densely setulose-hairy inside; corolla consisting of a ring of 7-40 small, more or less rudimentary petals, often shortly united at base: stamens about equal in number to the petals, rarely twice as many, anthers basifixed on short filaments and folded backwards; ovary sessile, globose, densely hispid-setulose, (2-)3-4(-8)-locular, style filiform, glabrous or pubescent, wiry, sinuate-contorted, stigma punctiform to capitate. **Fruit** globose, or rarely lanceolate, woody, 2-5-valved and dehiscent capsule, 1-5-seeded. **Seed** large, up to 4 cm long, with a smooth softly coriaceous testa, partly enclosed in a thin aril, with thick horny cotyledons and lacking endosperm.

Germination type hypogeal, with a tap-root emerging from one pole of the seed, the hypocotyl rupturing the testa and the shoot emerging through the slit; leaves arranged spirally, lower ones sometimes subopposite (Soerianegara and Lemmens, 1994),

Genus *Gonystylus* has several vernacular names. In Indonesia, this genus is called as gaharu buaya (Sumatra, Kalimantan), medang keladi (Kalimantan). Meanwhile, in Malaysia, this genus is known as melawis (Peninsular Malaya) and gaharu buaya (Sarawak). It is called as lanutan bagyo, anauan (general) in Philippines (Soerianegara and Lemmens, 1995). Ramin is a trade name for woods of some *Gonystylus* species such as *Gonystylus affinis* Radlk., *G. bancanus* (Miq.) Kurz, *G. forbesii* Gilg, *G. macrophyllus* (Miq.) Airy Shaw, *G. maingayi* Hook.f and *G. velutinus* Airy Shaw (Soerianegara and Lemmens 1995).

There is some debate about taxonomic position of genus *Gonystylus*. The genus is treated as a member of the family Thymelaeaceae, with the related small genera *Aetoxylon* and *Antyxa*. However, some authors place it as Gonystylaceae equal to the Thymelaeaceae. They regard it as more related to Tiliaceae or Flacourtiaceae.

In regards to identification the characteristic colours of the foliage in dry condition provides a useful diagnostic character for species identification. The identification of saplings is often difficult because of the differences in habit of young and mature plants. The absence of resin canals precludes confusion with any dipterocarp timber (Soerianegara and Lemmens 1994).

2.1.2. Characteristic of the Selected Species

The *Gonystylus* (non-*Gonystylus bancanus*) species descriptions in this section are selected from the 29 species and 1 variety from Malesian region described by Airy Shaw (see Airy Shaw 1953, 1972 and 1973, for complete species description). The 11 species chosen here are the species that produce major commercial timber (Soerianegara and Lemmens, 1994).

1. *Gonystylus affinis* Radlk.

Reference: Airy Shaw, Fl. Mal. I, Vol 4 (1953) 357; Tree Flora of Malaya, Vol. 2 (1983) 388; Soerianegara & Lemmens, PROSEA 5, 1 (1994) 226; Soepadmo, Saw & Chung, Tree Flora of Sabah and Sarawak, Vol. 5 (2004) 452.

Tree of up to 33 m tall, bole up to 90 cm in diameter, fluted, bark surface smooth to shallowly fissured and sloughing in square scales, reddish to brown, occasionally with white patches, inner bark, pink; leaves elliptical to almost oblong, 9-19 cm x 3.5-8.5 cm. broadly cuneate to rounded at base, shortly caudate-acuminate at apex, margin markedly revolute, glabrous above, often rather persistently tomentellous below, especially on the midrib, petiole 10-15(-20) mm long; inflorescence 8-15 cm long, densely fulvous-tomentellous; petals about 20, filiform-subulate, glabrous; fruit globose, up to 4 cm in diameter.

2. *Gonystylus brunnescens* Airy Shaw

Reference: Airy Shaw, Fl. Mal. I, Vol 4 (1953) 356; Whitemore, Tree Flora of Malaya, Vol. 2 (1983) 388; Soerianegara & Lemmens, PROSEA 5, 1 (1994) 227; Soepadmo, Saw & Chung, Tree Flora of Sabah and Sarawak, Vol. 5 (2004) 456.

Medium-sized to large tree up to 86(-45) m tall, bole fluted, up to 95 cm in diameter bark surface fissured. roughly cracking to slightly scaly with elongated scales, brown, inner bark pink, sapwood yellow; leaves elliptical to oblong, 12-26 cm x 4-10 cm, cuneate to rounded at base, rounded or subacute at apex, glabrous, petiole 12-15 mm long; inflorescence 4-11 cm long, finely pubescent or ferruginous-tomentellous; petals 25-30, subulate-filiform glabrous outside, rather densely retrorse-hispid inside; fruit ovoid, up to 6 cm in diameter.

3. *Gonystylus confusus* Airy Shaw

Reference: Airy Shaw, Fl. Mal. I, Vol 4 (1953) 357; Whitemore, Tree Flora of Malaya, Vol. 2 (1983) 391; Soerianegara & Lemmens, PROSEA 5, 1 (1994) 228.

Small to medium tree up to 30 m tall, bole up to 70 cm in diameter, bark surface not fissured, with elongated, adherent scales, dull grey and green or dark brown, inner bark yellow and pink; leaves oblanceolate-oblong or rarely oblong, 8-27 cm x 2-9 cm, cuneate to rounded at base, cuspidate to shortly acuminate at apex glabrous except for a few adpressed hairs near the midrib below, petiole 8-17 mm long; inflorescence 6-20 cm long; calyx lobes not reflexed, petals about 30, subulate-filiform glabrous, ovary with 3 Small abortive styles around the base of the functional style; fruit subglobose, 4-10 cm in diameter.

4. *Gonystylus consanguineus* Airy Shaw

Reference: Airy Shaw, Fl. Mal. I, Vol 6 (1972) 979; Whitemore, Tree Flora of Malaya, Vol. 2 (1983) 388; Soerianegara & Lemmens, PROSEA 5,1 (1994) 228; Soepadmo, Saw & Chung, Tree Flora of Sabah and Sarawak, Vol. 5 (2004) 458.

Medium-sized to large tree up to 40 m tall, bole branchless for up to 30 in, up to 80 cm in diameter, fluted at base and with small buttresses, bark surface not fissured; smooth or with elongated scales, red-brown to dark brown; inner bark laminated, cream to ochre, sapwood pale yellow; leaves elliptical to oblong, 10-25 cm x 5-9 cm, broadly cuneate at base, abruptly caudate-acuminate at apex, glabrous or sparsely hairy on the midrib below, petiole 7-12 mm long. Inflorescence 10-13 cm long; calyx lobes finally reflexed, petals about 30, small, glabrous.

5. *Gonystylus forbesii* Gilg.

Reference: Airy Shaw, Fl. Mal. I, Vol 4 (1953) 357; Soerianegara & Lemmens, PROSEA 5, 1 (1994) 228; Soepadmo, Saw & Chung, Tree Flora of Sabah and Sarawak, Vol. 5 (2004) 461.

Medium-sized to fairly large tree of up to 40 m tall, bole often rather poorly shaped, up to 85 cm in diameter, angular, usually fluted at the base but not buttressed, bark surface rather dark brown, inner bark orange-yellow, sapwood white, often with faint longitudinal streaks; leaves elliptical, often almost rhomboid, 4-10(-11.5) cm x 25-5 cm, usually markedly cuneate at base, cuneate-acuminate or sometimes rounded and caudate at apex,

glabrous or thinly puberulous below; petiole 9-11 mm long; inflorescence 5-15 cm long; calix lobes reflexed, petals about 10, ovate-deltoid tomentellous throughout and setulose inside: fruit oblong-ellipsoid, about 3 cm in diameter.

6. *Gonystylus keithii* Airy Shaw

Reference: Airy Shaw, Fl. Mal. I, Vol 4 (1953) 356; Soerianegara & Lemmens, PROSEA 5, 1 (1994) 228; Soepadmo, Saw & Chung, Tree Flora of Sabah and Sarawak, Vol. 5 (2004) 458.

Shrub or small to medium-sized tree of up to 26 m tall, bole up to 90 cm in diameter; leaves elliptical-oblong to oblanceolate 3-24 cm x 4-9 cm; cuneate at base and gradually narrowed at apex practically glabrous throughout, petiole 1-1.5 cm long; inflorescence 8-13 cm long; calix lobes strongly revolute, petals 20-22, subulate, retrorse-setulose inside.

7. *Gonystylus lucidulus* Airy Shaw

Reference: Airy Shaw, Fl. Mal. I, Vol 6 (1972) 981; Soerianegara & Lemmens, PROSEA 5, 1 (1994) 229; Soepadmo, Saw & Chung, Tree Flora of Sabah and Sarawak, Vol. 5 (2004) 463.

Medium-sized to large tree of up to 36 m tall, bole branchless for up to 27 m, up to 40 cm in diameter, fissured, bark surface scaly, dark brown, inner bark pale brown, sap-wood pale yellow or yellow; leaves oblong to elliptical-oblong, 10-20 cm x 5-8 cm, rounded at base and broadly but abruptly caudate, glabrous, petiole 12-18 mm long; inflorescence up to 18 cm long; fruit lanceolate-ovoid, 1.7 cm in diameter.

8. *Gonystylus macrophyllus* (Miq.) Airy Shaw

Reference: Airy Shaw, Fl. Mal. I, Vol 4 (1953) 354; Soerianegara & Lemmens, PROSEA 5, 1 (1994) 229; Soepadmo, Saw & Chung, Tree Flora of Sabah and Sarawak, Vol. 5 (2004) 464.

Medium-sized to large tree of up to 45 m tall, bole up to 100 cm in diameter; leaves exceedingly variable in size and shape, oblong, elliptical,

obovate or sublanceolate, 2-40 cm x 2-15 cm, cuneate to rounded at base, acuminate to rounded or even retuse at apex, glabrous, petiole up to 25 mm long; inflorescence elongate, up to 20 cm long; calyx lobes not reflexed, petals 20-40, narrowly subulate, glabrous; fruit subglobose, up to 7 cm in diameter.

9. *Gonystylus maingayi* Hook.f.

Reference: Airy Shaw, Fl. Mal. I, Vol 4 (1953) 359; Whitemore, Tree Flora of Malaya, Vol. 2 (1983) 391; Soerianegara & Lemmens, PROSEA 5, 1 (1994) 229; Soepadmo, Saw & Chung, Tree Flora of Sabah and Sarawak, Vol. 5 (2004) 465.

Medium-sized to large tree of up to 40 m tall, bole branchless for up to 31 m, up to 75 cm in diameter, sometimes with a fluted base, bark surface cracking to fissured and scaly, pale grey to dark brown or red-brown, inner bark orange; leaves elliptical-oblong, 7-12(-17) cm x 2.5-4.5(-6) cm, cuneate to rounded at base, narrowed and acuminate at apex, adult leaves glabrous but midrib thinly puberulous below, petiole 8-15 mm long; inflorescence about 20 cm long; calyx lobes revolute, petals 10-12, triangular-subulate to ovate-acuminate, glabrous; fruit ovoid to rounded, 2.5-3 cm in diameter.

10. *Gonystylus velutinus* Airy Shaw

Reference: Airy Shaw, Fl. Mal. I, Vol 4 (1953) 359; Soerianegara & Lemmens, PROSEA 5, 1 (1994) 229; Soepadmo, Saw & Chung, Tree Flora of Sabah and Sarawak, Vol. 5 (2004) 473.

Medium-sized to fairly large tree of up to 35 m tall, bole up to 70 cm in diameter; leaves elliptical, oblong-elliptical or lanceolate-elliptical, 8-11 (-13) cm x 3.5-5 cm, cuneate to subrotundate at base, shortly and narrowly cuspidate-acuminate at apex, usually more or less pubescent below, petiole 7-11 mm long; inflorescence 7-12 cm long; calyx lobes strongly revolute, petals 7-8, deltoid, acute; fruit lanceolate-oblong, 1.2 -2.5 cm in diameter.

11. *Gonystylus xylocarpus* Airy Shaw

Reference: Airy Shaw, Fl. Mal. I, Vol 4 (1953) 355; Soerianegara & Lemmens, PROSEA 5, 1 (1994) 230; Soepadmo, Saw & Chung, Tree Flora of Sabah and Sarawak, Vol. 5 (2004) 473.

Medium-sized to fairly large tree of up to 36 m tall, bole cylindrical, up to 75 cm in diameter, fluted at base, bark surface flaky, dark to red-brown; leaves broadly elliptical, 10-17 cm x 4.5-9 cm, rounded at base and shortly subapiculate to rounded at apex, the midrib sparsely puberulous below; inflorescence up to 18 cm long; calyx lobes recurved, petals 35-40, narrowly subulate, glabrous; fruit globose, up to 7.6 cm in diameter.

2.2. Phenology

Many authors have mentioned that flowering season for *Gonystylus* species is vary (Airy Shaw 1953; Alrasyid and Soerianegara 1978; Partomihardjo 2005; Partomihardjo 2006, 2007). According to these authors, ramin usually blossom between February-March as well as Mei to October. Alrasyid and Soerianegara (1978) reported that ramin tree was fruiting between April-May. In addition to Alrasyid and Soerianegara, Airy Shaw (1953) mentioned that fruiting season also happens between May to June.

Partomihardjo (2006) has observed *Gonystylus* flowering period based on 55 herbarium specimens deposited in Herbarium Bogoriense, Bogor. His study showed that flowering and fruiting periods of ramin in Sumatera occur between August and October, although ramin trees sometimes produce flower and fruit in May. Meanwhile in Kalimantan, flowering and fruiting periods of ramin occur between January-May. Ramin's fruit ripe 2-3 months after anthesis.



Figure 5.
Flowering tree
of *Gonystylus*
macrophyllus in
Bogor Botanical
Garden
(inflorescence
in circle)



Figure 6.
Open flower of
Gonystylus
macrophyllus in
Bogor
Botanical
Garden

Following those field and herbarium observations, Harun (2009, pers. comm.), a staff of Bogor Botanical Garden mentioned that fruiting season for *Gonystylus velutinus* collection in Bogor Botanical Garden is between January-March. Meanwhile, the flowering period for *G. macrophyllus* in the Garden is between January-late-April. He also noted that the death of one

G. macrophyllus tree in the Garden's collection has been affected the fruiting of the remaining tree. The remaining *G. macrophyllus* tree has not yet produced fruit since the lost of another tree several years ago. This carefully observation could lead to the need of studying flower biology and pollination mechanism of the *Gonystylus* species.

Flower biology and pollination syndrome are very important for determining regeneration capability and population dynamics (Partomihardjo 2005). A study on pollen morphology of the family Thymelaeaceae including genus *Gonystylus* has been done by Nowicke *et al.* (1985). However, the knowledge on flower biology and pollination syndrome of genus *Gonystylus* is still lacking. Thus, further studies are very crucial to be conducted.

III. ECOLOGY

3.1. Habitat Preference

The species of *Gonystylus* typically found in primary non-inundated rainforest at low and medium elevations, reaching 1200 m altitude in Sumatra and 1500 m in Borneo and the Philippines (Soerianegara and Lemmens, 1994). Different to *G. bancanus* (the most commercial species), other *Gonystylus* species have different range of habitat as summarized in Table 1 below.

Table 1. Habitat preference of *Gonystylus* species

No.	Species	Habit	Habitat
1	<i>Gonystylus acuminatus</i> Airy Shaw	Small tree 25 m by 50 cm	Primary lowland rainforest, at 150 m asl.
2	<i>Gonystylus affinis</i> Radlk.	Small tree up to 24 m	Primary open rainforest, up to 240 m asl.
3	<i>Gonystylus affinis</i> Radlk. var. <i>elegans</i> Airy Shaw	Small tree up to 24 m	Primary open rainforest, up to 240 m asl.
4	<i>Gonystylus areolatus</i> Domke ex. Airy Shaw	Small tree; \leq 20 cm diameter	Lowland rainforest
5	<i>Gonystylus augescens</i> Ridl.	Small tree; \leq 20 cm diameter	Lowland rainforest
6	<i>Gonystylus bancanus</i> (Miq.) Kurz.	Medium tree up to 42 m by 120 cm	Peat swamp forest
7	<i>Gonystylus borneensis</i> (Tiegh.) Gilg.	Shrubs/Small tree, diameter up to 60 cm	Lowland rainforest
8	<i>Gonystylus brunescens</i> Airy Shaw	Small tree 10-20 m	Non-inundated rainforest, up to 345 m asl.
9	<i>Gonystylus calophylloides</i> Airy Shaw	Small tree up to 6 m, \leq 20 cm diameter	Banks of rocky stream at 210 m asl.
10	<i>Gonystylus calophyllus</i> Gilg.	Shrubs / Small tree, \leq 20 cm diameter	Lowland rainforest
11	<i>Gonystylus confusus</i> Airy Shaw	Small tree 30 m by 60 cm	Non-inundated rainforest to hill-side
12	<i>Gonystylus consanguineus</i> Airy Shaw	Medium tree 16-40 m	Primary and disturbed rainforest

13	<i>Gonystylus costalis</i> Airy Shaw	Small tree 4-5 m, ≤ 20 cm diameter	Primary rainforest, on ridge with sandy clay soil at 210 m asl.
14	<i>Gonystylus decipiens</i> Airy Shaw	Medium tree 25-30 m	Primary rainforest, on sand stone, up to 500 m asl.
15	<i>Gonystylus eximius</i> Airy Shaw	Small tree, ≤ 20 cm diameter	Lowland rainforest, on slope near river banks to 240 m asl.
16	<i>Gonystylus forbesii</i> Gilg.	Medium tree 40 m by 85 cm	Non-inundated primary rainforest, up to 1210 m asl.
17	<i>Gonystylus glaucescens</i> Airy Shaw	Small tree 10 m, ≤ 20 cm diameter	Sandstone ridge at 400 m
18	<i>Gonystylus keithii</i> Airy Shaw	Shrubs / Small tree 25 m by 90 cm	Non-inundated rain forest up to 410 m
19	<i>Gonystylus lucidulus</i> Airy Shaw	Medium tree up to 36 m	Lowland Dipterocarp forest (30-270 m)
20	<i>Gonystylus macrophyllus</i> (Miq.) Airy Shaw	Medium tree, up to 45 m tall by 1 m diameter	Low land primary forest, medium altitude
21	<i>Gonystylus maingayi</i> Hook. f.	Small tree up to 27 m	Primary rain forest up to 150 m (<i>peat swamp</i>)
22	<i>Gonystylus micranthus</i> Airy Shaw	Small tree 18 m by 60 cm	Unknown/primary lowland forest <i>marsh</i>
23	<i>Gonystylus nervosus</i> Airy Shaw	Small tree 4-5 m, ≤ 20 cm diameter	Primary rain forest on limestone hills
24	<i>Gonystylus nobilis</i> Airy Shaw	Medium tree 24 m	Primary lowland Dipterocarp
25	<i>Gonystylus pendulus</i> Airy Shaw	Small tree 10 m by 12 cm	Evergreen rain forest at 360 m
26	<i>Gonystylus reticulatus</i> (Elm.) Merr.	Small slender tree, ≤ 20 cm diameter	Evergreen rain forest
27	<i>Gonystylus spectabilis</i> Airy Shaw	Medium tree up to 24 m	Presumably rain-forest on ridge at 195
28	<i>Gonystylus stenosepalus</i> Airy Shaw	Small tree	Unknown (primary forest)
29	<i>Gonystylus velutinus</i> Airy Shaw	Medium tree 35 m by 70 cm	Primary rain forest low alt. non-inundation
30	<i>Gonystylus xylocarpus</i> Airy Shaw	Small tree to medium	Rain forest at low altitude (<i>heat forest</i>)

Source and modified from: Airy Shaw (1953,1972 and 1973), Sidiyasa (2005), Bismarck *et al.* (2005).

The most widespread species *G. macrophyllus* occurs in primary forest at low and medium altitudes, ascending to 1200 m in Sumatra and to 1500 m in Sabah and the Philippines (Airy Shaw 1953; Soerianegara and Lemmens, 1994). It might well prove that the present concept of this species is too wide and that several distinct species can be recognized especially from the eastern Malesian region. On the other hand, *G. maingayi* occurs in primary lowland rain forest and in peat swamp forest up to 150(-200) in altitude and *G. velutinus* occurs scatteredly.



Figure 7.
Non-inundated rainforest
habitat of *Gonystylus*
macrophyllus at Cabang Panti,
Gunung Palung National Park,
West Kalimantan

3.2. Associated Species

It is mentioned in the previous sub-section that *Gonystylus* species are typically found in primary non-inundated rainforest at low and medium elevations to 1500 m asl. It is associated with different tree species as reported by many authors. In most habitats, ramin is principally associated

with *Shorea albida*, *Dactylocladus stenostachys*, *Dyera lowii*, *Cratoxylum arborescens*, *Palaquium* spp., and *Calophyllum* spp. (Soerianegara and Lemmens 1994).

Bismark *et al.* (2005) based on cruising result, reported that ramin in Riau Sumatra has a community association with meranti (*Shorea* spp.), durian burung (*Durio* spp.), bintangur (*Calophyllum retusum*), balam (*Alseodaphne macrocarpa*), rengas (*Gluta renghas*), arang-arang (*Diospyros paniculata*), pisang-pisang (*Mezzetia parviflora*), punak, jangkang, medang (*Cryptocarya* spp.), geronggang (*Cratoxylon* spp.), and darah-darah (*Horsfeldia globularis*).

Additionally, Bismark *et al.* (2005) also reported that in Central Kalimantan, in Forest Concession of Koperasi Serba Usaha Bajenta (1999), ramin has association with geronggang (*Cratoxylon* spp.), bintangur (*Calophyllum* spp.), jelutung (*Dyera costulata*), alau (*Dacrydium pectinatum*), nyatoh (*Palaquium* spp.), kayu malam (*Diospyros pseudomalabarica*), tumuh (*Combretocarpus rotundatus*), kapur naga (*Dryobalanops* spp.), pisang-pisang (*Mezzetia leptopoda*), mahang (*Tetraastroemia* spp.) jambu (*Eugenia* spp.), and gemur (*Alseodaphne coriacea*). Some tree species also associated with ramin in West Kalimantan such as geronggang (*Cratoxylon arborescens*), punak (*Tetramerista glabra*), belangiran (*Shorea balangeran*), kapur (*Dryobalanops* spp.), bintangur (*Calophyllum* spp.) and gelam tikus (*Melaleuca leucadendron*).

In accordance to Bismark *et al.*'s studies, Sidiyasa (2005), from direct observation in Kabupaten Kapuas, Central Kalimantan reported that ramin trees also associated with *Koompassia malaccensis*, *Mezzetia parviflora*, *Diospyros siamang*, *Aglaiia rubiginosa* and *Mussaendopsis beccariana*.

3.3. Population Distributions

The *Gonystylus* species are distributed almost throughout the Malesian. Airy Shaw (1953, 1972 and 1973) has mentioned this area with the distribution exception; i.e. Central and East Java and the Lesser Sunda Islands. However, a single specimen of *G. macrophyllum* from Flores was found among of Herbarium Bogoriense (BO) specimens studied (see Appendix 3). *Gonystylus* distribution continues eastward towards the Solomon Islands, Nicobar and Fiji.

The vast majority of species is found on Borneo (27), especially in Sarawak, Peninsular Malaysia and Sumatra (Table 2).

Table 2. Distribution and number of *Gonystylus* species in Malesian Region

Island/Area	Number of species	Number of endemics
Malay Peninsula	7	0
Sumatra	7	0
Java	1	0
Borneo	27	19
Philippines	2	1
Sulawesi	1	0
Mollucas	1	0
New Guinea	1	0

Source : Airy Shaw (1953,1972 and 1973), Sidiyasa (2005).

Note : Borneo; includes Sarawak, Sabah, Brunei Darussalam and Kalimantan.

The distribution trends show the decreasing number of species towards eastern part of Malesian region. Distribution detail of each species summarized in Table 3.

Table 3. List of *Gonystylus* species and its distribution

No.	Species	Distribution
1	<i>Gonystylus acuminatus</i> Airy Shaw	Malaya, Sumatra, Sarawak
2	<i>Gonystylus affinis</i> Radlk.	Malaya, Sarawak, West Kalimantan
3	<i>Gonystylus affinis</i> Radlk. var. <i>elegans</i> Airy Shaw	Sarawak
4	<i>Gonystylus areolatus</i> Domke ex. Airy Shaw	Sarawak
5	<i>Gonystylus augescens</i> Ridl.	Sarawak, West Kalimantan
6	<i>Gonystylus bancanus</i> (Miq.) Kurz.	Malaya, Sumatra, Bangka, Borneo
7	<i>Gonystylus borneensis</i> (Tiegh.) Gilg.	Sarawak, Sabah, Central Kalimantan
8	<i>Gonystylus brunescens</i> Airy Shaw	Malaya, Brunei Darussalam, Sabah, West Kalimantan, East Kalimantan
9	<i>Gonystylus calophylloides</i> Airy Shaw	Sarawak
10	<i>Gonystylus calophyllus</i> Gilg.	Sarawak
11	<i>Gonystylus confusus</i> Airy Shaw	Malaya, Sumatra (Aceh), West Kalimantan
12	<i>Gonystylus consanguineus</i> Airy Shaw	Sarawak, Sabah, West Kalimantan, East Kalimantan
13	<i>Gonystylus costalis</i> Airy Shaw	Sarawak
14	<i>Gonystylus decipiens</i> Airy Shaw	Sarawak
15	<i>Gonystylus eximius</i> Airy Shaw	Sarawak
16	<i>Gonystylus forbesii</i> Gilg.	Sumatra (including Mentawai Islands), Sabah, South Kalimantan
17	<i>Gonystylus glaucescens</i> Airy Shaw	East Kalimantan
18	<i>Gonystylus keithii</i> Airy Shaw	Sarawak, Sabah, Kalimantan
19	<i>Gonystylus lucidulus</i> Airy Shaw	Sarawak, Brunei Darussalam
20	<i>Gonystylus macrophyllus</i> (Miq.) Airy Shaw	Nicobar, Malesia (except Central and East Java, Bali and Nusa Tenggara), Solomon, Fiji
21	<i>Gonystylus maingayi</i> Hook. f.	Malaya, Sumatra, Brunei Darussalam, Sarawak, Sabah
22	<i>Gonystylus micranthus</i> Airy Shaw	Sarawak, South Kalimantan
23	<i>Gonystylus nervosus</i> Airy Shaw	Sarawak
24	<i>Gonystylus nobilis</i> Airy Shaw	Sarawak
25	<i>Gonystylus pendulus</i> Airy Shaw	Sarawak
26	<i>Gonystylus reticulatus</i> (Elm.) Merr.	Philippines
27	<i>Gonystylus spectabilis</i> Airy Shaw	Sarawak, West Kalimantan
28	<i>Gonystylus stenosepalus</i> Airy Shaw	Sarawak, Sabah
29	<i>Gonystylus velutinus</i> Airy Shaw	Sumatra (including Bangka & Belitung)
30	<i>Gonystylus xylocarpus</i> Airy Shaw	Sarawak, West Kalimantan

Source : Airy Shaw (1953, 1972 & 1973), Sidiyasa (2005), Result from study by team at West Kalimantan.

Note : Borneo; includes Sarawak, Sabah, Brunei Darussalam and Kalimantan.

In regards to population distribution data status, the review team has encountered several facts as follows:

- Available data is very insufficient in term of data number and data age. Most of species data collected from three herbaria is very limited except data for the widely distributed *G. macrophyllus* due to the vast number of specimens represented this species. On the other hand, the majority of specimens were collected before 1990's and only a small proportion of specimens of non-*G. bancanus* species collected after 1990's.
- In many specimens, locality details did not recorded and written, therefore, many of these specimens are less informative for tracing the potential distribution location for *Gonystylus* species. Furthermore, additional information on specimen labels is also lacking. Of the more than 200 herbarium specimens in Herbarium Bogoriense, only 55 specimens have phenological note as it has mention in phenological study by Partomihardjo (2006).
- Observation on specimens and specimen's databases showed a significant number of unidentified *Gonystylus* species (still labeled as *Gonystylus* sp.). Our national resource person, Dr. Kade Sidiyasa from Herbarium Wanariset Samboja has explained that such of condition is caused by a non-user friendly identification keys or in other words, the available identification keys are not easy to use. This situation increase the number of unidentified *Gonystylus* specimens.

Based on this circumscription, a series of data updating process are utterly required and should be placed as the prioritize activity for *Gonystylus* study. However, under the limited data condition, a series of distribution map are provided in Appendix 4.

IV. POTENCY

4.1. Regeneration Potential

Regeneration capability of the forest tree species is very dependant to the successful reproduction cycle that started from flower formation to the seedling development (Partomihardjo 2005). The failure in one of the reproduction steps could fatally affected regeneration process and the development of the new tree stand (Smith 1986 in Ashton 1998), although this processes are also environmentally influenced.

Slow natural regeneration capability has been recorded for *Gonystylus* (Tim Ramin 2003, 2004, 2005; Partomihardjo 2005). This is proven by lack of seedlings under parent trees. Population of ramin shows abnormality in which it has more large individuals compared with smaller trees (Sutisna *et al.*, 1988; Daryono 1996).



Figure 8.
Gonystylus confusus (X) at Cabang Panti, Gunung Palung National Park, West Kalimantan, measured during author's visit

An example of the slow growing *Gonystylus* has also found during the review process. In the duration of the review, a brief survey on *Gonystylus* species has been conducted during discussion with Dr. Campbell O. Webb at Cabang Panti, Gunung Palung National Park, West Kalimantan. During the visit, a measurement has been taken on *G. confusus* (see figure 8) tree diameter in a 40x40 m² plot (GP23 SS/BB 97 40). The result was compared to the previously recorded data of Dr. Webb from 12 years ago and showed that tree diameter has increased 3 cm within 12 years period.

The current circumscription must be considered in the future development of conservation efforts and in the sustainable use and trade for *Gonystylus* or ramin species. Over exploitation combined with the slow growing habit could lead to the severe depletion of the species.

4.2. Timber and Other Potential Uses

The available information about potential uses of *Gonystylus* species non-*G. bancanus* is very limited compare to the data on the uses of *G. bancanus*. Of those 11 species other than *G. bancanus* are traded under ramin name for their valuable wood (Soerianegara and Lemmens 1994; CITES 2004; Sidiyasa 2005).

The ramin whitish timber is highly prized and popular as a decorative cabinet timber, furniture, interior decoration such as wall paneling, flooring, toys, broom handles and other non-impact handles, Venetian blind slats, dowels, rulers, picture frames and drawing boards. Ramin is also used for general light construction such as door and window frames, mouldings, skirtings, ceilings, partitions, stair treads and counter tops. (Various other applications are planks, barrels, and shipboards. (Soerianegara and Lemmens 1994).

Despite producing timber, several *Gonystylus* species also produce non-timber forest products such as medicine, poison and incense that are valuable for the local people income (Sidiyasa 2005). The infected heartwood of *G. macrophyllus* and several other species is use for incense (just like *Aquilaria* spp.). The pounded fruit of *G. keithii* mixed with wood and ashes can be use for fish poison. Meanwhile decoction of *G. confusus* root as well as several other species can be use for protective medicine in administered after childbirth (Airy Shaw 1953; Soerianegara and Lemmens 1994; Sidiyasa 2005).

V. CONCLUSIONS AND RECOMMENDATIONS

5.1. Conclusions

- Genus *Gonystylus*, comprises 29 species and 1 variety distributed throughout Malesian region (including Indonesia) with center of diversity in Borneo. The centres for distribution of the genus in Indonesia are in Sumatera (Aceh, North Sumatra, West Sumatra, Riau, Jambi, Bangka and Belitung and Lampung) and Kalimantan (West Kalimantan, Central Kalimantan and East Kalimantan).
- Besides *G. bancanus* there are other 5 species *Gonystylus* (*Gonystylus affinis*, *G. forbesii*, *G. macrophyllus*, *G. maingayi* and *G. velutinus*) in international trade of those 11 species that produce commercial timber and 2 species (*G. micranthus* dan *G. xylocarpus*) that locally use.
- *Gonystylus* species usually occur in non-inundated lowland forest up to 1500 m asl, except *Gonystylus brunnescens*, *G. micranthus* & *G. maingayi* that preferres more wet or damp areas. Unlike *G. bancanus* that is usually dominant in peat swamp, several *Gonystylus* species (e.g. *G. velutinus* and *G. confusus*) occur scatteredly.
- Flowering and fruiting season of *Gonystylus* species is varied every year. Flowering and fruiting season occur between February-March and May-October. Flowering season in Sumatera occur between August-October, meanwhile in Kalimantan, the blossoming period happens between January-May.
- The slow regeneration process on *Gonystylus* became a barrier for its natural population recovery. Together with the insufficient knowledge on flower biology and pollination syndrome, the slow regeneration process could create a major obstacle for the species conservation and sustainable use.

5.2. Recommendations

- Conduct series of studies on biology (including phenology and breeding), ecology and potency for *Gonystylus* species other than *G. bancanus*. Data and information resulted from this proposed study will be useful for assessing species status in IUCN redlist and CITES appendices.
- Forming a *clearing house* mechanism (CHM) for data sharing and updating among of the involved institutions and stake holders related to genus *Gonystylus* in specific and other species included in CITES appendices in general. This data can be functioned as reference data for CITES implementation in Indonesia.
- Form a team to monitor and conduct a thorough study on the stock and distribution of *Gonystylus* species other than *G. bancanus* in the field, following the previously existed national team for *G. bancanus*.
- West Kalimantan and East Kalimantan are highly recommended as the main targeted area for ground survey of *Gonystylus* non-bancanus, following by other potential distribution areas.
- Develop an effective method or technology in order to accelerate ramin's growth rate and to overcome the natural slow growing barrier. Furthermore, the existing seed stands should be protected and seedling seed orchard as well as clonally seed orchard should be developed.

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Literature Review on *Gonystylus* spp. other than *Gonystylus bancanus*:
Botany, Ecology and Potency

APPENDICES

Literature Review on *Gonystylus* spp. other than *Gonystylus bancanus*:
Botany, Ecology and Potency

Appendix 1.

Gonystylus spp. (other than *G. bancanus*) Data from Herbarium Wanariset (WAN), Seed Technology Research Institute of Samboja, Forestry Research and Development, Ministry of Forest of Forestry, Indonesia

SPECIES	COLLECTOR	NO	COLLECTED	MINOR AREA	GAZETTEER	LAT	NS	LONG	EW	ALT
<i>Gonystylus affinis</i>	Suzuki, E.	10042	20/08/1994	West Kalimantan	Gunung Sunujuh	1.26	N	109.27	E	160
<i>Gonystylus affinis</i>	Ambriansyah; Arifin, Z.	30	01/11/1990	East Kalimantan	Sepaku	0		0		120
<i>Gonystylus affinis</i>	Ambriansyah; Arifin, Z.	905	04/01/1994	East Kalimantan	Sungai Wain	-1	S	117	E	70
<i>Gonystylus affinis</i>	Arbainsyah	1005	20/02/1995	East Kalimantan	Sungai Wain	-1	S	117	E	
<i>Gonystylus affinis</i>	Kessler, P.J.A. <i>et al.</i>	863	09/10/1997	East Kalimantan	Labanan	1.59	N	117.15	E	40
<i>Gonystylus affinis</i>	Kessler, P.J.A. <i>et al.</i>	676	24/09/1997	East Kalimantan	Labanan	0		0		20
<i>Gonystylus borneensis</i>	Latupeirissa, E.R.	94402	03/12/1994	Central Kalimantan	Sangai	-1.29	S	112.31	E	50
<i>Gonystylus brunnescens</i>	Sidiyasa, K.	1266	01/12/1996	East Kalimantan	Kenangan	0		0		250
<i>Gonystylus brunnescens</i>	Sidiyasa, K.	511	12/11/1990	East Kalimantan	Kenangan	0		0		
<i>Gonystylus brunnescens</i>	Sidiyasa, K.	694	28/02/1991	East Kalimantan	Kenangan	0		0		190
<i>Gonystylus consanguineus</i>	Latupeirissa, E.R.	94399	03/12/1994	Central Kalimantan	Sangai	-1.29	S	112.31	E	50
<i>Gonystylus consanguineus</i>	Ambriansyah; Arifin, Z.	673	14/02/1991	East Kalimantan	Samboja	-1	S	117	E	50
<i>Gonystylus</i> sp.	Laman, T.G. <i>et al.</i>	1033	02/10/1997	West Kalimantan	Gunung Palung	-1.13	S	110.06	E	25
<i>Gonystylus</i> sp.	Laman, T.G. <i>et al.</i>	1088	04/10/1997	West Kalimantan	Gunung Palung	-1.13	S	110.06	E	45
<i>Gonystylus</i> sp.	Laman, T.G. <i>et al.</i>	1099	05/10/1997	West Kalimantan	Gunung Palung	-1.13	S	110.06	E	40
<i>Gonystylus</i> sp.	Laman, T.G. <i>et al.</i>	1424	25/10/1997	West Kalimantan	Gunung Palung	-1.13	S	110.06	E	20
<i>Gonystylus</i> sp.	Argent, G. <i>et al.</i>	93149	14/05/1993	Central Kalimantan	Sangai	-1.22	S	112.31	E	100
<i>Gonystylus</i> sp.	Argent, G. <i>et al.</i>	9462	15/02/1994	Central Kalimantan	Sangai	-1.18	S	112.32	E	50
<i>Gonystylus</i> sp.	Djuda, T.I.	280	00/11/1993	Central Kalimantan	Sangai	-1.29	S	112.31	E	50
<i>Gonystylus</i> sp.	Kessler, P.J.A. <i>et al.</i>	1471	24/10/1996	Central Kalimantan	Sangai	-1.17	S	112.22	E	130

Continued.

SPECIES	COLLECTOR	NO	COLLECTED	MINOR AREA	GAZETTEER	LAT	NS	LONG	EW	ALT
<i>Gonystylus</i> sp.	Latupeirissa, E.R.	1011	1994	Central Kalimantan	Sangai	-1.29	S	112.31	E	50
<i>Gonystylus</i> sp.	Latupeirissa, E.R.	1007	1994	Central Kalimantan	Sangai	-1.29	S	112.31	E	50
<i>Gonystylus</i> sp.	Latupeirissa, E.R.	19	1994	Central Kalimantan	Sangai	-1.29	S	112.31	E	50
<i>Gonystylus</i> sp.	Latupeirissa, E.R.	504	1994	Central Kalimantan	Sangai	-1.29	S	112.31	E	50
<i>Gonystylus</i> sp.	Latupeirissa, E.R.	683	1994	Central Kalimantan	Sangai	-1.29	S	112.31	E	50
<i>Gonystylus</i> sp.	Ridsdale, C.E.	475	09/06/1990	Central Kalimantan	Barito Ulu	-0.02	S	114.06	E	
<i>Gonystylus</i> sp.	Sidiyasa, K.	421	09/06/1990	Central Kalimantan	Barito Ulu	-0.02	S	114.06	E	
<i>Gonystylus</i> sp.	Sidiyasa, K.	617	23/06/1990	Central Kalimantan	Barito Ulu	-0.02	S	114.06	E	
<i>Gonystylus</i> sp.	Yulita, K.S.; Wilkie, P.	93409	00/07/1993	Central Kalimantan	Sangai	-1.29	S	112.31	E	50
<i>Gonystylus</i> sp.	Ambriansyah et al.	882	09/10/1997	East Kalimantan	Labanan	0		0		50
<i>Gonystylus</i> sp.	Ambriansyah; Arifin, Z.	1084	17/12/1997	East Kalimantan	Labanan	2	N	117	E	
<i>Gonystylus</i> sp.	Arifin, Z.; Ambriansyah	1032	09/12/1997	East Kalimantan	Labanan	2	N	117	E	
<i>Gonystylus</i> sp.	Arifin, Z.; Arbainsyah	816	02/10/1997	East Kalimantan	Labanan	0		0		100
<i>Gonystylus</i> sp.	Kessler, P.J.A. et al.	2251	23/03/1997	East Kalimantan	Gunung Runcing	-0.2	S	115.55	E	100
<i>Gonystylus</i> sp.	Lenjau, D.; Lawing, I.	264	10/12/1996	East Kalimantan	Kayan Mentarang	0		0		650
<i>Gonystylus spectabilis</i>	Latupeirissa, E.R.	94407	05/12/1994	Central Kalimantan	Sangai	-1.29	S	112.31	E	50
<i>Gonystylus velutinus</i>	Ambriansyah; Arifin, Z.	904	04/01/1994	East Kalimantan	Sungai Wain	-1	S	117	E	70
<i>Gonystylus velutinus</i>	Ambriansyah; Arifin, Z.	528	10/12/1990	East Kalimantan	Samboja	-1	S	117	E	70
<i>Gonystylus velutinus</i>	Ambriansyah; Arifin, Z.	370	13/09/1990	East Kalimantan	Samboja	-1	S	117	E	50
<i>Gonystylus velutinus</i>	Kessler, P.J.A. et al.	792	03/10/1997	East Kalimantan	Labanan	0		0		30

Appendix 2.

Gonystylus spp. (other than *G. bancanus*) Data from Herbarium of Botany and Ecology Division (BZF), Centre for Forest and Nature Conservation Research and Development (P3HKA), Forestry Research and Development, Ministry of Forestry, Indonesia.

KALIMANTAN

No.	Species	Collection Number	Local Name	Distribution	Alt. (m asl)	Year Collected	Dbh	Total Height
1	<i>G. affinis</i> A. Shaw.	bb. 6415	Banit	Landak, Ngabang, West Kalimantan	40	28-11-1924	32 cm	26 m
2	<i>G. brunescens</i> A. Shaw.	bb. 28350	Mahabai binjak	B, Melaban kecil, Melawi, West Kalimantan	345	25-6-1939	45 cm	21 m
3	<i>G. brunescens</i> A. Shaw.	bb. 29629	Lemiar	B. Gontuk hayan, Nanga Betung, Melawi, West Kalimantan	250	11-10-1939	39 cm	22 m
4	<i>G. brunescens</i> A. Shaw.	bb. 31633	Gerima	B. Mungguk, Nanga Betung, Melawi, West Kalimantan	175	29-1-1940	53 cm	23 m
5	<i>G. brunescens</i> A. Shaw.	bb. 35008	Garu buaya	Sampit, Central Kalimantan	-	10/1/1952	50 cm	20 m
6	<i>G. brunescens</i> A. Shaw.	bb. 35247	Melingkut pepah	Semulung ulu, Kapuas ulu, West Kalimantan	40	17-11-1953	41 cm	28 m
7	<i>G. brunescens</i> A. Shaw.	bb. 35248	Melingkut pepah	Semulung ulu, Kapuas ulu, West Kalimantan	40	17-11-1953	44 cm	21 m
8	<i>G. brunescens</i> A. Shaw.	bb. 36321	Pala hutan	Gn.Rapen, Mukut, Muara Teweh, Central Kalimantan	75	15-10-1970	8 cm	9 m
9	<i>G. brunescens</i> A. Shaw.	bb. 37108	Melingku	Sei Bunut, Manakang, Kapuas ulu, Central Kalimantan	50	20-6-1977	20 cm	24 m
10	<i>G. brunescens</i> A. Shaw.	bb. 37320	Pala, k	Sei Kenamai, Gn Rantan, Buntok, Central Kalimantan	-	16-3-1979	40 cm	36 m
11	<i>G. brunescens</i> A. Shaw.	bb. 37345	Pala	Sei Kenamai, Gn Rantan, Buntok, Central Kalimantan	-	24-3-1979	50 cm	25 m
12	<i>G. forbesii</i> Gilg.	bb. 8153	Merang	Tuwei baru, Dayak ulu, Central Kalimantan	40	7/3/1925	55 cm	33 m
13	<i>G. forbesii</i> Gilg.	bb. 9931	Bakumbal	Karuang, Sampit, Central Kalimantan	10	11/6/1926	82 cm	37 m
14	<i>G. forbesii</i> Gilg.	bb. 10213	Bakumbal	Tehang, Sampit, Central Kalimantan	120	28.7-1926	55 cm	28 m
15	<i>G. forbesii</i> Gilg.	bb. 11217	Dedarah putih	Sungai Rumah, Salembatu, Bulungan, East Kalimantan	150	6/4/1927	70 cm	27 m
16	<i>G. forbesii</i> Gilg.	bb. 16577	Serkaya	Ma. Ancalong, Kutal barat, East Kalimantan	-	25-3-1932	70 cm	33 m
17	<i>G. forbesii</i> Gilg.	bb. 23083	Anggelam lampong	G. Ruyung niung, Kutai Barat, East Kalimantan	75	27-8-1937	45cm	19 m
18	<i>G. forbesii</i> Gilg.	bb. 28329	Pauh balang	B. Melabab kecil, Melaw, West Kalimantan,	475	21-6-1939	50cm	37 m

Continued.

No.	Species	Collection Number	Local Name	Distribution	Alt. (m asl)	Year Collected	Dbh	Total Height
19	<i>G. forbesii</i> Gilg.	E. 4923	-	R. Puhus, Kutal Barat, East Kalimantan	100	14-11-1925	60 cm	30 m
20	<i>G. keithii</i> A. Shaw.	bb. 11685	Letung	Sungai Bengalun kabiran, Bulungan, East Kalimantan	150	27-7-1927	45 cm	26 m
21	<i>G. keithii</i> A. Shaw.	bb. 11865	-	Pelawan, Sangkulirang, Kutai Timur, East Kalimantan	75	18-9-1927	40 cm	23 m
22	<i>G. keithii</i> A. Shaw.	bb. 12146	-	Inaran, Berau, East Kalimantan	100	25-10-1927	60 cm	26 m
23	<i>G. keithii</i> A. Shaw.	bb. 17893	Banitan gunung	Malinau, Tidung, East Kalimantan	15	11-6-1933	40 cm	17 m
24	<i>G. keithii</i> A. Shaw.	bb. 26329	Sampah songkop	Catit, B. Tengkujung, Melawi, West Kalimantan	370	25-10-1938	40 cm	22 m
25	<i>G. keithii</i> A. Shaw.	bb. 26450	Suwai	Catit, B. Tengkujung, Melawi, West Kalimantan	340	1-12-1938	48 cm	23 m
26	<i>G. keithii</i> A. Shaw.	bb. 26459	Bepisang	Catit, B. Tengkujung, Melawi, West Kalimantan	410	4-12-1938	47 cm	15 m
27	<i>G. keithii</i> A. Shaw.	bb. 34791	Emalitan	Sg. Kerajaan Sangkulirang. Kutai Timur, East Kalimantan	20	18-6-1951	46 cm	25 m
28	<i>G. macrophyllus</i> A. Shaw.	bb. 6363	Medang haran	Kubu padi, Pontianak, West Kalimantan	5	8-4-1924	33 cm	18 m
29	<i>G. macrophyllus</i> A. Shaw.	bb. 16647	Garu betul	Bonti, Sanggau, West Kalimantan	100	12-4-1932	75 cm	24 m
30	<i>G. macrophyllus</i> A. Shaw.	bb. 18575	Garu buaya	Nagri Baru, Matan ilir, West Kalimantan	2	6-4-1934	46 cm	24 m
31	<i>G. macrophyllus</i> A. Shaw.	bb. 36081	Melingkut	Sei Mengkurai, Sintang, East Kalimantan	40	22-2-1963	36 cm	19 m
32	<i>G. macrophyllus</i> A. Shaw.	bb. 36317	R.gunung/ G.Gunung	Gn.Rapen, Mukut, Muara Teweh, Central Kalimantan	-	15-10-1970	10 cm	11 m
33	<i>G. ve!utinus</i> A. Shaw.	bb. 10626	Pale	Maruwai, Puruk cahu, Central Kalimantan	60	4-12-1926	30 cm	23 m
34	<i>G. ve!utinus</i> A. Shaw.	bb. 11184	-	S. Rumah, Salim Batu, Bulungan, East Kalimantan	150	2-4-1927	60 cm	28 m
35	<i>G. ve!utinus</i> A. Shaw.	bb. 17012	Babingkal	Sanggau, West Kalimantan	10	30-5-1932	20 cm	17 m
36	<i>G. ve!utinus</i> A. Shaw.	bb. 18655	Minyak,k.	Mangsang, Musiilir, South Sumatera	15	12-8-1934	60 cm	23 m
37	<i>G. ve!utinus</i> A. Shaw.	bb. 31632	Besiluh	B. Mungguk, Betung, Melawi, West Kalimantan	175	29-1-1940	52 cm	43 m
38	<i>G. ve!utinus</i> A. Shaw.	bb. 34396	Bangkirai warek	Sungai Wain, Balikpapan, East Kalimantan	40	15-10-1950	58 cm	37 m
39	<i>G. ve!utinus</i> A. Shaw.	bb. 35022	Seranai	SungaiTiram, KutaiTimur, East Kalimantan	40	15-4-1952	28 cm	24 m
40	<i>G. ve!utinus</i> A. Shaw.	bb. 35848	Medang samak	Sei bulan, Pontianak, West Kalimantan	-	11-9-1909	50 cm	36 m

Continued.

No.	Species	Collection Number	Local Name	Distribution	Alt. (m asl)	Year Collected	Dbh	Total Height
41	<i>G. velutinus</i> A. Shaw.	bb. 36236	Ramin laki2, Siangun	Teluk belanga, Pontianak, West Kalimantan	-	9-2-1970	65 cm	25 m
42	<i>G. velutinus</i> A. Shaw.	bb. 16908	Lempong	Muyup, Kutai Barat, East kalimantan.	30	7/5/1932	45 cm	30 m
43	<i>G. sp.</i>	bb. 10942	Pala, Pasai	Ma. Supan, Puruk cahu, Central Kalimantan	200	22-3-1927	35 cm	22 m
44	<i>G. sp.</i>	bb. 2074	Garu buaya	S. Pamulian. Sampit, Central Kalimantan	-	7-12-1920	-	-
45	<i>G. sp.</i>	bb. 25148	Pelipisan	Sei Pengi, Jembayan. Kutai Barat, East Kalimantan	6	2-7-1 936	35 cm	20 m
46	<i>G. sp.</i>	bb. 26993	Seriangun	Nungu naning, Sukadana, West Kalimantan	-	14-2-1939	40 cm	22 m
47	<i>G. sp.</i>	bb. 34512	Ampuji	Sangkulirang, Sg Menumbar. Kutai timur, East Kalimantan	20	11/6/1931	54 cm	25 m
48	<i>G. sp.</i>	E. 3852	-	Kemul, Kutai Barat, East Kalimantan	1200	10-9-1925	40 cm	20 m
49	<i>G. sp.</i>	E. 4785	-	L. Hub, Kutai Barat, East Kalimantan	150	10-11-1925	50 cm	25 m

Appendix 3.

Gonystylus spp. (other than *G. bancanus*) Data from IBIS Database of Herbarium Bogoriense (BO), Botany Division, Research Centre for Biology, Indonesian Institute of Sciences (LIPI)

Kalimantan

No.	Species	BO No.	Collector	Coll. No.	Locality
1	<i>Gonystylus acuminatus</i>		Endert, F.H.	4785	Borneo, W. Koetai
2	<i>Gonystylus affinis</i>	BO-0083931	Suman, J.G.	542	Borneo, Sendayan, Forest Reserve.
3	<i>Gonystylus affinis</i>	BO-0083942	Jong, B. de	129. HB.	Borneo, West Borneo, Landak, Ngabang.
4	<i>Gonystylus augescens</i>	BO-0083943	Ashton, P.S.	s.5928	Borneo, Brunei. Andulau Forest Reserve. Primary forest, disturbed, on low undulating tertiary hills, 120 ft.
5	<i>Gonystylus borneensis</i>	BO-1374065	Latupeirissa, E.R.	94402	Borneo, Kalimantan, Plot 1. Sangai, S. Mentaya, Kab. Kotawaringin Timur.
6	<i>Gonystylus borneensis</i>	BO-1374065	Latupeirissa, E.R.	94402	Borneo. Central Kalimantan. Kab. Kotawaringin Timur. S. Mentaya. Plot 1
7	<i>Gonystylus borneensis</i>	BO-1598342	Mohizah, M., Yahud & Yance	ITTO/BA 0416	Borneo. South of Derian Base Camp, Bentuang Karimun National park.
8	<i>Gonystylus borneensis</i>	BO-1319466	Jarvie, J.K. & Ruskandi, A.	6024	Borneo; Central Kalimantan, Samba. 1994-1995 cutting blocks of PT Handayani
9	<i>Gonystylus borneensis</i>	BO-1319466	Jarvie, J.K. & Ruskandi, A.	6024	Borneo; Central Kalimantan; Samba
10	<i>Gonystylus brunnescens</i>	BO-0124778	Partomihardjo, T.	1099	Borneo (West Kalimantan) Taman Nasional Bentuang Karimun
11	<i>Gonystylus brunnescens</i>	BO-0124777	Partomihardjo, T.	1099	Borneo (West Kalimantan) Taman Nasional Bentuang Karimun
12	<i>Gonystylus brunnescens</i>	BO-1606702	Budding, L.	326	Borneo, Wester afd v. Borneo Melawi, b. Melabon Kebiri.
13	<i>Gonystylus brunnescens</i>	BO-1606691	Almawi, A.	1	Borneo, Z. O. Borneo. Ond. Afd Sampit, Sampit.
14	<i>Gonystylus brunnescens</i>	BO-1405929	Teysmann	s.n.	Borneo, Landak.
15	<i>Gonystylus brunnescens</i>	BO-1405930	Teysmann	s.n.	Borneo, Landak.
16	<i>Gonystylus brunnescens</i>	BO-0083728	Endert, F.H.	4204	Borneo, Ond. Afd, W.Koetai, no.38 b/d Kemoel.
17	<i>Gonystylus brunnescens</i>	BO-1606703	Endert, F.H.	4204	Borneo, Ond. Afd, W.Koetai, no.38 b/d Kemoel.
18	<i>Gonystylus brunnescens</i>	BO-0083727	Endert, F.H.	4204	Borneo, Ond. Afd, W.Koetai, no.38 b/d Kemoel.

Continued.

No.	Species	BO No.	Collector	Coll. No.	Locality
19	<i>Gonystylus brunnescens</i>	BO-0083731	Ender, F.H.	3852	Borneo, Ond. Afd. : W- Koetai n. 37 b/d Kemoel.
20	<i>Gonystylus brunnescens</i>	BO-1606692	Kostermans, A.	22	Borneo, Ond. Afd. Oost- Kutei Sg. Menubar (Sangkulirang).
21	<i>Gonystylus brunnescens</i>	BO-1606695	Esche, H.	52	Borneo, W Borneo. Upper Kapuas River village of Semulung-ulu.
22	<i>Gonystylus brunnescens</i>	BO-1606694	Esche, H.	51	Borneo, W. Borneo Upper Kapuas river Village of Semulung-Ulu.
23	<i>Gonystylus brunnescens</i>	BO-1405931	Jong, B. de	496/WB	Borneo, West Borneo Landschap Simpang Djeroengkong
24	<i>Gonystylus brunnescens</i>	BO-1405926	Budding, L.	417	Borneo, Wester afd. P. Borneo. Melawai Na. Besoeng B. Gantoe Kajan.
25	<i>Gonystylus brunnescens</i>	BO-1405925	Budding, L.	417	Borneo, Wester afd. P. Borneo. Melawai Na. Besoeng B. Gantoe Kajan.
26	<i>Gonystylus brunnescens</i>	BO-1405927	Soedarsono	15	Borneo, Wester afd.v. Borneo Melamia Ng. Betong. B. Moenggoel
27	<i>Gonystylus brunnescens</i>	BO-1319473	Mahjar, U.W., Ruskandi, A.	A.C. 166	Borneo; W. Kalimantan, Sintang. Bukit Baka National Park. Slope NE of camp; environs leading up to ridge.
28	<i>Gonystylus confusus</i>	BO-0010316	McDonald, J.A. & Ismail	3515	Borneo, E. Kalimantan, Pujungan District, Kayan-Mentarang Nature Reserve, Gong biou River
29	<i>Gonystylus confusus</i>	BO-1319677	Church, A.C. & Mahyar, U.M.	1434	Borneo, W. Kalimantan; Serawai. 8 km NE of Desa Jelundung, Batu Lintang. 1 km south of camp
30	<i>Gonystylus confusus</i>	BO-1319678	Church, A.C. & Mahyar, U.M.	1434	Borneo, W. Kalimantan; Serawai. 8 km NE of Desa Jelundung, Batu Lintang. 1 km south of camp
31	<i>Gonystylus forbesii</i>	BO-1601419	Kostermans	s.n	Borneo, Kutei, village of long bleh.
32	<i>Gonystylus forbesii</i>	BO-0083801	Ender, F.H.	4923	Borneo, Ond. Afd. : W. Koetai, no. 19
33	<i>Gonystylus forbesii</i>	BO-1601420	Kostermans	4339	Borneo, Sg. Wain region, N. of Balikpapan.
34	<i>Gonystylus forbesii</i>	BO-0083799	Budding, L.	305	Borneo, Wester Afd v. Borneo Melawi B. Kelaban, ketjil.
35	<i>Gonystylus forbesii</i>	BO-0083797	Atjil, A.	4	Borneo, Z. en O Afd v. Borneo Sampit, Tehang.
36	<i>Gonystylus forbesii</i>	BO-0083780	Atjil, A.	203	Borneo, Z. en O afd v. Borneo. West Koetai Moejoep.
37	<i>Gonystylus forbesii</i>	BO-1601415	Boschproefstation	bb.16.824	Borneo, Z. en O Afd. West. Koetai. Moejoep. ± 35 m.
38	<i>Gonystylus forbesii</i>	BO-0083802	Henar, G.H.	82	Borneo, Z. on O Afd. V. Borneo Ond afd Boven Mahakam Loempako.
39	<i>Gonystylus forbesii</i>	BO-1405905	Henar, G.H.	82	Borneo, Z. Afd.v.Borneo, Boven Mahakam, Loempako.
40	<i>Gonystylus forbesii</i>	BO-0083778	Zwaan, C.J. van der	165	Borneo, Z.en. O.Afd.v.Borneo, Boelaevard, Salimbatoe, Boeloengan.

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No.	Species	BO No.	Collector	Coll. No.	Locality
41	<i>Gonystylus forbesii</i>	BO-0083781	Atjil, A.	2359	Borneo, Z.en.O.Afd.v.Borneo, West Koetei, Moejoep.
42	<i>Gonystylus forbesii</i>	BO-0083800	Delmaar, C.N.J.	2830	Borneo, Z.O. Afd.van Borneo, Beneden Dajak.
43	<i>Gonystylus forbesii</i>	BO-0083779	Atjil, A. & Matali, B.	24	Borneo, Z.O.van Borneo, Sampit, Karoeing.
44	<i>Gonystylus keithii</i>	BO-1405910	Zwaan, C.J. van der	330	Borneo, z. en o. Afd. V. Borneo Beoloengan Kabiran, s. Bengaloen.
45	<i>Gonystylus keithii</i>	BO-1405911	Zwaan, C.J. van der	613	borneo, Z. en O. Afd. V. Borneo Berouw Inaran.
46	<i>Gonystylus keithii</i>	BO-0124775	Partomihardjo, T.	1277	Borneo, (West Kalimantan) Taman Nasional Bentuang Karimun.
47	<i>Gonystylus keithii</i>	BO-0124776	Partomihardjo, T.	1277	Borneo, (West Kalimantan) Taman Nasional Bentuang Karimun.
48	<i>Gonystylus keithii</i>	BO-1343193	Mahyar, U.M., et al	1193	Borneo, C.Kalimantan, Sintang HPH Km 86; along new subsidiary logging road to west.
49	<i>Gonystylus keithii</i>	BO-1621682	Pearce, K.G., Teo, S. & Wiradinata, H.	ITTO/BB 0553	Borneo, Hill east of Camp B, Ulu Katibas, Sg. Joh
50	<i>Gonystylus keithii</i>	BO-1601434	Kostermans, A.	141	Borneo, Ond. Afd. Oost Kutei, Sg Kerajaan (Sangkulirang).
51	<i>Gonystylus keithii</i>	BO-1405913	Budding, L.	178	Borneo, Wester afd.v.Borneo, Ond Afd.Melawi, Tjatit, B.Tengkoejoeng
52	<i>Gonystylus keithii</i>	BO-1601431	Budding, L.	115	Borneo, Westerafd.v.Borneo, Ond. Afd, Melawi, Tjatit, B.Tengkoejoeng.
53	<i>Gonystylus keithii</i>	BO-1405912	Zwaan, C.J. van der	454	Borneo, Z. en O. Afd v. Borneo Oost Koetei (Sangkoelirang) Palawan.
54	<i>Gonystylus keithii</i>	BO-1517536	Pearce, K.G., Teo, S. & Wiradinata, H.	ITTO/BB0553	Borneo. (See overleaf): Hill east of Camp B, Ulu Katibas, Sg. Joh.
55	<i>Gonystylus macrophyllus</i>	BO-1405918	Atjil, A.	83	Borneo Z. O.Bn. Poeroektjahoe Ma Djaan.
56	<i>Gonystylus macrophyllus</i>	BO-1405922	Norman	56	Borneo, West-Borneo. Beneden ,matau Negri baroe.
57	<i>Gonystylus macrophyllus</i>	BO-1601445	Veldkamp	8493	Borneo, Batu badinding, KCT 47 km.
58	<i>Gonystylus macrophyllus</i>	BO-1601456	Kostermans, A.	5286	Borneo, East Borneo, E.Kutei, G.Tepian Lobang.
59	<i>Gonystylus macrophyllus</i>	BO-1601455	Kostermans, A.	5286	Borneo, East Borneo, E.Kutei, G.Tepian Lobang.
60	<i>Gonystylus macrophyllus</i>	BO-1601454	Kostermans, A.	5371	Borneo, East Borneo, E.Kutei, Sg.Menubar region.
61	<i>Gonystylus macrophyllus</i>	BO-1601453	Kostermans, A.	13901	Borneo, East Borneo, Mt.Ilas Bungaan.
62	<i>Gonystylus macrophyllus</i>	BO-1601464	Budding, L.	1	Borneo, West Kalimantan, Ond. Afd. Sintang, Sei Mengkarai.
63	<i>Gonystylus macrophyllus</i>	BO-1601448	Teysmann	11489	Borneo, Pontianak.

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No.	Species	BO No.	Collector	Coll. No.	Locality
64	<i>Gonystylus macrophyllus</i>	BO-1601463	Hout, v.	s.n.	Borneo, Sambas.
65	<i>Gonystylus macrophyllus</i>	BO-1601461	Hout, v.	s.n.	Borneo, Sambas.
66	<i>Gonystylus macrophyllus</i>	BO-1601462	Hout, v.	s.n.	Borneo, Sambas.
67	<i>Gonystylus macrophyllus</i>	BO-1582917	Ashton, P.S.	S.21129	Borneo, Sarawak, Ga Amau, Ulu Amau, Mujong, Balleh.
68	<i>Gonystylus macrophyllus</i>	BO-1601446	Anderson, J.A.R.	12861	Borneo, Sarawak, Simanggang, One mile from Triso.
69	<i>Gonystylus macrophyllus</i>	BO-1405916	Jong, B. de	77 W.B.	Borneo, West Borneo. Pontianak- Koeboepadi.
70	<i>Gonystylus macrophyllus</i>	BO-1405915	Jong, B. de	77 W.B.	Borneo, West Borneo. Pontianak- Koeboepadi.
71	<i>Gonystylus macrophyllus</i>	BO-1601466	Budding, L.	115	Borneo, West. Afd Borneo, Mnelawi.
72	<i>Gonystylus macrophyllus</i>	BO-1601465	Budding, L.	478	Borneo, Wester Afd.v.Borneo, Melawie.
73	<i>Gonystylus macrophyllus</i>	BO-1601459	Soelaiman, G.	b.b.16.647	Borneo, Westerafd.v.Borneo, Sanggau (Bonti) Ginis (Mawa).
74	<i>Gonystylus macrophyllus</i>	BO-1601460	Soelaiman, G.	b.b.16.647	Borneo, Westerafd.v.Borneo, Sanggau (Bonti) Ginis (Mawa).
75	<i>Gonystylus macrophyllus</i>	BO-1601451	Norman	56	Borneo, Weterafd.v. Borneo, Boven en Beneden matan, Negri - Baroe.
76	<i>Gonystylus macrophyllus</i>	BO-1405917	Zwaan, C.J. van der	47	Borneo, Z en O Afd. Van Borneo. Boeloengon, Mara.
77	<i>Gonystylus maingayi</i>	BO-0083713	Kostermans, A.	8051	Borneo, S. Borneo. Sampit R region; Keminting near Kuala Kuajan.
78	<i>Gonystylus maingayi</i>	BO-1675617	Nooteboom	4291	Borneo, Bukit Raya.
79	<i>Gonystylus maingayi</i>	BO-0083715	Zwaan, C.J. van der	P.853	Borneo, Palembang, Lematang Ilir, goenoeng Megang.
80	<i>Gonystylus maingayi</i>	BO-0083714	Zwaan, C.J. van der	P.853	Borneo, Palembang, Lematang Ilir, goenoeng Megang.
81	<i>Gonystylus maingayi</i>	BO-0083716	Zwaan, C.J. van der	P.853	Borneo, Palembang, Lematang Ilir, goenoeng Megang.
82	<i>Gonystylus maingayi</i>	BO-1675620	Kostermans, A.	7931	Borneo, S.Borneo, Sampit R. region near Kuala Kuajan.
83	<i>Gonystylus maingayi</i>	BO-1319468	Jarvie, J.K. & Ruskandi, A.	5115	Borneo; Central Kalimantan, Samba. 1994-1995 cutting blocks of PT Handayani
84	<i>Gonystylus maingayi</i>	BO-1319465	Jarvie, J.K. & Ruskandi, A.	5559	Borneo; Central Kalimantan, Samba. 1994-1995 cutting blocks of PT Handayani
85	<i>Gonystylus sp.</i>	BO-0086929	Teysmann, J.E.	7929	Borneo, B. Singkadjang
86	<i>Gonystylus sp.</i>	BO-0086930	Teysmann, J.E.	7929	Borneo, B. Singkadjang

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No.	Species	BO No.	Collector	Coll. No.	Locality
87	<i>Gonystylus sp.</i>	BO-0086928	Teysmann, J.E.	7929	Borneo, B. Singkadjang
88	<i>Gonystylus sp.</i>	BO-1390060	Wilkie, P.	94309	Borneo, 10 km along road at km 57 from Sangai (S.Mentaya), Kab.Kotawaringin Timur.
89	<i>Gonystylus sp.</i>	BO-1607733	Clemens	50705	Borneo, B.N.Borneo, Mt.Kinabalu.
90	<i>Gonystylus sp.</i>	BO-1405956	Wood, D.D.	2469	Borneo, B.N.Borneo.
91	<i>Gonystylus sp.</i>	BO-1675654	Nooteboom	4077	Borneo, Bukit Raya.
92	<i>Gonystylus sp.</i>	BO-1675653	Nooteboom	4359	Borneo, Bukit Raya.
93	<i>Gonystylus sp.</i>	BO-1370583	Djuda, Tuke I.	94209	Borneo, C. Kalimantan, Kab. Kotawaringin Timur, Plot 3. Tree #132. Km 92 from Sangai (S. Mentaya).
94	<i>Gonystylus sp.</i>	BO-1376567	Djuda, Tuke I.	94247	Borneo, Central Kalimantan, Kab. Kotawaringin Timur. Km 92 from Sangai (S. Mentaya). Plot 3.
95	<i>Gonystylus sp.</i>	BO-1362289	Sidiyasa, K.	1266	Borneo, E.Kalimantan, PT. ITCI Kenangan, around Birawa camp, 60 km north of Kenangan.
96	<i>Gonystylus sp.</i>	BO-1362290	Sidiyasa, K.	1266	Borneo, E.Kalimantan, PT. ITCI Kenangan, around Birawa camp, 60 km north of Kenangan.
97	<i>Gonystylus sp.</i>	BO-1607726	Kostermans, A.	13936	Borneo, East Borneo, Berouw, Mt. Ilas Bungaan.
98	<i>Gonystylus sp.</i>	BO-1607729	Kostermans, A.	13489	Borneo, East Borneo, Sangkulirang District, Mt. Medadam, N. of Sangkulirang.
99	<i>Gonystylus sp.</i>	BO-1607730	Kostermans, A.	13489	Borneo, East Borneo, Sangkulirang District, Mt. Medadam, N. of Sangkulirang.
100	<i>Gonystylus sp.</i>	BO-1675613	Bompard, J.M.	761	Borneo, East Kalimantan Province, Kutai, Damai, P/T/Sumalindo logging Camp Sungai Perak, km 45.
101	<i>Gonystylus sp.</i>	BO-1675611	Bompard, J.M.	761	Borneo, East Kalimantan Province, Kutai, Damai, P/T/Sumalindo logging Camp Sungai Perak, km 45.
102	<i>Gonystylus sp.</i>	BO-1362819	Arifin, Z. & Ambriansyah	816	Borneo, East Kalimantan, Berau Inhutani area, km 28, Jl. To plot.
103	<i>Gonystylus sp.</i>	BO-1362891	Ambriansyah et al.	882	Borneo, East Kalimantan, Berau Inhutani area, km 31, along transect G.
104	<i>Gonystylus sp.</i>	BO-1362892	Kessler et al.	863	Borneo, East Kalimantan, Berau, Inhutani area, km 16, along trayek.
105	<i>Gonystylus sp.</i>	BO-1359487	Ambriansyah & Arifin, Z.	1084	Borneo, East Kalimantan, Berau, km 15 from Labanan, LBN transect C. Berau forest Management Project (BFMP)
106	<i>Gonystylus sp.</i>	BO-1359485	Arifin, Z. & Ambriansyah	1032	Borneo, East Kalimantan, Berau, km 28 from Labanan, Berau Forest Mangement Project (BFMP) Swakelola, Labanan.

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No.	Species	BO No.	Collector	Coll. No.	Locality
107	<i>Gonystylus sp.</i>	BO-1359486	Arifin, Z. & Ambriansyah	1035	Borneo, East Kalimantan, Berau, km 28 from Labanan, Berau forest Mangement Project (BFMP) Swakelola, Labanan.
108	<i>Gonystylus sp.</i>	BO-1400738	Ambriansyah & Arifin, Z.	AA.905	Borneo, East Kalimantan, Froyek Fruits orang utan area, km 21 Sungai Waein.
109	<i>Gonystylus sp.</i>	BO-1399375	Ambriansyah & Arifin, Z.	AA.904	borneo, East Kalimantan, Proyek fruits orang utan area, Km 21 Sungai Waein.
110	<i>Gonystylus sp.</i>		Sidiyasa, K.	694	Borneo, East Kalimantan, PT. ITCI area, permanent growth and yield plot no. 71-1
111	<i>Gonystylus sp.</i>	BO-1399262	Kessler et al.	PK.2251	Borneo, East Kalimantan, PT. KEM area, Gunung Runcing.
112	<i>Gonystylus sp.</i>	BO-0017870	Sidiyasa, K.	694	Borneo, East Kalimantan, PT.ITCI area, permanent growth and yield plot no.71-1.
113	<i>Gonystylus sp.</i>	BO-0017871	Sidiyasa, K.	694	Borneo, East Kalimantan, PT.ITCI area, permanent growth and yield plot no.71-1.
114	<i>Gonystylus sp.</i>	BO-1484823	Kohyama, Yamada & Tukirin	K.10576	Borneo, G.Berui 2.5 km SSW Kota Serimbu.
115	<i>Gonystylus sp.</i>	BO-1359696	Arbainsyah	A.A.1005	Borneo, Hutan Lindung Sungai Wain area, off Km 15 Balikpapan.
116	<i>Gonystylus sp.</i>	BO-0009492	Sidyasa, K.	PBU.421	Borneo, Central Kalimantan, Base camp P.B.U. and environs off trail Jl. Banbang.
117	<i>Gonystylus sp.</i>	BO-0009848	Ridsdale, C.E.	PBU.475	Borneo, Central Kalimantan, P.B.U. base camp and environs.
118	<i>Gonystylus sp.</i>	BO-0009040	Sidiyasa, K.	PBU.671	Borneo, Central Kalimantan, PT. Pamenang logging concession Rd. c. km 20.
119	<i>Gonystylus sp.</i>	BO-1607728	Kostermans	3	Borneo, Kalimantan, Kutei.
120	<i>Gonystylus sp.</i>	BO-0014031	Argent, G., Saridan, A. & Wilkie, P.	9462	Borneo, Km 92 from Sangai, S.Mentaya, Kab. Kotawaringin Timur.
121	<i>Gonystylus sp.</i>	BO-1607727	Kostermans, A.	9131	Borneo, N.E.Borneo, island Nunukan (northern part).
122	<i>Gonystylus sp.</i>	BO-0009402	Ridsdale, C.E.	PBU.65	Borneo, P.B.U. base camp and environs. Trail Jalang Nancy.
123	<i>Gonystylus sp.</i>	BO-1370563	Djuda, Tuke I.	94205	Borneo, Plot 3. Km 92 from Sangai (S.Mentaya), Kab. Kotawaringin Timur.
124	<i>Gonystylus sp.</i>	BO-1675665	Bianchi, A.T.J.	22	Borneo, West Borneo, Pamangkat, Paloh.
125	<i>Gonystylus sp.</i>	BO-1607732	Pangkey, S.	58	Borneo, Z.en.O.Afd.v.Borneo, West Koetei, Djembajan.
126	<i>Gonystylus sp.</i>	BO-0086931	Lot Obi	3562	Borneo, Z.O. afd. v. Borneo, Onderafd Poeroek Tjahoe, Ma Soyam
127	<i>Gonystylus sp.</i>	BO-1675661	Dachlan, M.	1	Borneo, Z.O. Borneo, Malinau.

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No.	Species	BO No.	Collector	Coll. No.	Locality
128	<i>Gonystylus sp.</i>	BO-1675662	Dachlan, M.	1	Borneo, Z.O. Borneo, Malinau.
129	<i>Gonystylus sp.</i>	BO-0086932	Lot Obi	3562	Borneo, Z.O.afd. v. Borneo, Poeroek tjahoe, Ma Soepan
130	<i>Gonystylus sp.</i>	BO-0086931	Obi, L.	3562	Borneo, Z.O.Afd.v.Borneo, Ond.Afd, Poeroek tjahoe.
131	<i>Gonystylus sp.</i>	BO-1374066	Latupeirissa, E.R.	94399	Borneo. Central Kalimantan. Kab. Kotawaringin Timur. S. Mentaya. Plot 1.
132	<i>Gonystylus sp.</i>	BO-1319462	Jarvie, J.K. & Ruskandi, A.	5356	Borneo; Central Kalimantan, Samba. 1994-1995 cutting blocks of PT Handayani
133	<i>Gonystylus sp.</i>	BO-1320129	Jarvie, J.K. & Ruskandi, A.	5647	Borneo; Central Kalimantan, Samba. 1994-1995 cutting blocks of PT Handayani
134	<i>Gonystylus sp.</i>	BO-1320126	Jarvie, J.K. & Ruskandi, A.	5303	Borneo; Central Kalimantan, Samba. 1994-1995 cutting blocks of PT Handayani
135	<i>Gonystylus sp.</i>	BO-1319676	Jarvie, J.K. & Ruskandi, A.	5611	Borneo; Central Kalimantan, Samba. 1994-1995 cutting blocks of PT Handayani
136	<i>Gonystylus sp.</i>	BO-1319467	Jarvie, J.K. & Ruskandi, A.	5104	Borneo; Central Kalimantan, Samba. 1994-1995 cutting blocks of PT Handayani
137	<i>Gonystylus sp.</i>	BO-1320127	Jarvie, J.K. & Ruskandi, A.	5303	Borneo; Central Kalimantan; Samba. 1994-1995 cutting blocks of PT Handayani
138	<i>Gonystylus sp.</i>	BO-1319473	Church, A.C., et al.	166	Borneo; W. Kalimantan, Sintang. Bukit Baka National Park. Slope NE of camp; environs leading up to ridge
139	<i>Gonystylus sp.</i>	BO-1319678	Church, A.C. & Mahyar, U.W.	1434	Borneo; W. Kalimantan; Serawai. 8 Km NE of Desa Jelundung, Batu Lintang. 1 km south of camp
140	<i>Gonystylus sp.</i>	BO-1319464	Church, A.C. & Mahyar, U.W.	1439	Borneo; W. Kalimantan; Serawai. 8 Km NE of Desa Jelundung, Batu Lintang. 1 km south of camp
141	<i>Gonystylus sp.</i>	BO-1319680	Church, A.C. & Mahyar, U.W.	1426	Borneo; W. Kalimantan; Serawai. 8 Km NE of Desa Jelundung, Batu Lintang. 1 km SW of camp
142	<i>Gonystylus sp.</i>	BO-1319681	Church, A.C. & Mahyar, U.W.	1426	Borneo; W. Kalimantan; Serawai. 8 Km NE of Desa Jelundung, Batu Lintang. 1 km SW of camp.d
143	<i>Gonystylus sp.</i>	BO-1319463	Church, A.C. & Mahyar, U.W.	1959	Borneo; W. Kalimantan; Serawai. Sungai Merah; 1 km to W of camp around S. Labang
144	<i>Gonystylus spectabilis</i>	BO-1370576	Latupeirissa, E.R.	94407	Borneo, Central Kalimantan, Kab. Kotawaringin Timur, S. Mentaya, Sangai, On path to plot 6.
145	<i>Gonystylus sympetala</i>	BO-1249106	Soelaiman, G.	9	Borneo, Res. West Borneo, Ond.afd. Sanggau, nabij Mawa (Ginis)
146	<i>Gonystylus sympetalum</i>		Hout		Borneo, Sambas
147	<i>Gonystylus sympetalum</i>		Hout		Borneo, Kajoe Bidaroh, Sambas

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No.	Species	BO No.	Collector	Coll. No.	Locality
148	<i>Gonystylus velutinus</i>	BO-1675668	Wiriadinata, H.	867	Borneo Kecamatan Melak, Kresik Luwei.
149	<i>Gonystylus velutinus</i>	BO-1601486	Ghazalli, FG	11085	Borneo, Sarawak. Senengeh F. R.
150	<i>Gonystylus velutinus</i>	BO-1601496	Kostermans	6449	Borneo, Loa Djanan, West of Samarinda.
151	<i>Gonystylus velutinus</i>	BO-1601494	Kostermans	7173	Borneo, Tdg.Bangko region, mouth of Mahakam River.
152	<i>Gonystylus velutinus</i>	BO-1601495	Kostermans	7173	Borneo, Tdg.Bangko region, mouth of Mahakam River.
153	<i>Gonystylus velutinus</i>	BO-1675991	Afriastini, J.J.	1188	Borneo, W.Kalimantan, Batu Ampar, Teluk Air.
154	<i>Gonystylus velutinus</i>	BO-1676007	Afriastini, J.J.	1188	Borneo, W.Kalimantan, Batu Ampar, Teluk Air.
155	<i>Gonystylus velutinus</i>	BO-1405932	Soedarsono	14	Borneo, Wester Afd.v.Borneo, Melawie. Sg.Betoeng.
156	<i>Gonystylus velutinus</i>	BO-1405935	Wattimena, W.	b.b.17.012	Borneo, Wester Afd.v.Borneo, Sanggau, Beloenge, West Melian.
157	<i>Gonystylus velutinus</i>	BO-1405934	Wattimena, W.	b.b.17.012	Borneo, Wester Afd.v.Borneo, Sanggau, Beloenge, West Melian.
158	<i>Gonystylus velutinus</i>	BO-1601485	Boschproefstation	bb.16.908	Borneo, Z. en Afd West Koetai. Moejoep.
159	<i>Gonystylus velutinus</i>	BO-1405937	Zwaan, C.J. van der	b.b.11.184.	Borneo, Z.en.O. Afd.v.Borneo, Boeloengan, Salimbatoe, S.Roemah.
160	<i>Gonystylus velutinus</i>	BO-1405939	Atjil, A.	2444	Borneo, Z.en.O.Afd.v.Borneo, West Koetei, Moejoep.
161	<i>Gonystylus velutinus</i>	BO-1405938	Boschproefstation	b.b.11184	Borneo, Z.o.Afd, Boeloengan, Salimbatoe.
162	<i>Gonystylus velutinus</i>	BO-1601484	Kostermans, A.	11	Borneo, Z.O.Borneo, Ond. Afd. Oost Kutei, Sg.Tiram.
163	<i>Gonystylus velutinus</i>	BO-1601501	Ahmat	158	Borneo, Z.O.Borneo, Ond.Afd Balikpapan, Sungai Wain.
164	<i>Gonystylus velutinus</i>	BO-1405936	Oekoep	3490	Borneo, Z.O.Borneo, Tjahoe, Marowei.
165	<i>Gonystylus velutinus</i>	BO-1601499	Henar, G.H.	50	Borneo, Z.O.van Borneo, Boeloengan, Noenoekan.
166	<i>Gonystylus xylocarpus</i>	BO-1601502	Kostermans	7664	Borneo, Peak of Balikpapan, Berikan bulu.
167	<i>Gonystylus xylocarpus</i>	BO-1675616	Boschproefstation	b.b.11350	Borneo, W.Borneo, Pamangkat, Paloh.

Sumatra

No.	Species	BO No.	Collector	Coll. No.	Locality
1	<i>Gonystylus acuminatus</i>	BO-1675647	Mol, D.	57	Sumatra, Riouw en Ond, Koeantan district, Soegei Besar.
2	<i>Gonystylus bancanus</i>	BO-1606688	Kostermans, A.	965	Sumatra, Bangka, Lobok Besar, G.Pading.
3	<i>Gonystylus bancanus</i>	BO-1606687	Kostermans	154	Sumatra, Bangka, Lobok-besar.
4	<i>Gonystylus bancanus</i>	BO-0083755	Zainoeddin	6	Sumatra, Bengkalis, Sei Kempoeng.
5	<i>Gonystylus bancanus</i>	BO-0083750	Teysmann	3494	Sumatra, Jeboes, Bangka.
6	<i>Gonystylus bancanus</i>	BO-0083742	Bloh, P.	9	Sumatra.
7	<i>Gonystylus borneensis</i>	BO-1606689	Burley, J.S. & Tukirin et al.	1381	Sumatra, Tigapulu Mts., Riau Province, 5 km W of Talanglakat on Rengat-Jambi Road, Bukit Karampal Area.
8	<i>Gonystylus borneensis</i>	BO-1606690	Burley, J.S. & Tukirin et al.	1381	Sumatra, Tigapulu Mts., Riau Province, 5 km W of Talanglakat on Rengat-Jambi Road, Bukit Karampal Area.
9	<i>Gonystylus brunnescens</i>	BO-1606698	Burley, J.S. & Tukirin et al.	1503	Sumatra, Tigapulu Mts., Riau Province, 5 km W of Talanglakat on Rengat-Jambi Road, Bukit Karampal area.
10	<i>Gonystylus confusus</i>	BO-0083772	Soekoen	12	Sumatra, Atjeh en Onderh Tamijang Petroepoek.
11	<i>Gonystylus confusus</i>	BO-0083773	Badroen & Mantri	35	Sumatra. Gasw. Atjeh afd: Langsa, op Gasw. Caoutchave. Ondern.
12	<i>Gonystylus forbesii</i>	BO-0083789	Yates, H.S.	1412	Sumatra
13	<i>Gonystylus forbesii</i>	BO-1601427	Galoeng, A.H.	50	Sumatra, Tapanuli. Sibolga, Aek Laboean Talang P. Poenei (P. Moersala).
14	<i>Gonystylus forbesii</i>	BO-0083788	Buwalda, P.	97	Sumatra, Riouw en Ond Indrag Bovenlanden Danau Mengkoeang.
15	<i>Gonystylus forbesii</i>	BO-0083787	Buwalda, P.	97	Sumatra, Riouw en Ond Indrag Bovenlanden Danau Mengkoeang.
16	<i>Gonystylus forbesii</i>	BO-0083784	Katarnida	12	Sumatra, S.W.K. Mentawai-Eil. P.Siberoet Saberoet.
17	<i>Gonystylus forbesii</i>	BO-0083786	Katarnida	12	Sumatra, S.W.K. Mentawai-Eil. P.Siberoet Saberoet.
18	<i>Gonystylus forbesii</i>	BO-1601423	Hotta, M.	750	Sumatra, West Sumatra: Pinang-pinang Plot, Ulu Gadut, about 15 km east from Padang city.
19	<i>Gonystylus forbesii</i>	BO-0083795	Panditokari	6	Sumatra, Tapanoeli, Padang Lawas. Pasbatoe.
20	<i>Gonystylus forbesii</i>	BO-1601428	Galoeng, A.H.	54	Sumatra, Tapanoeli. Sibolga Aek Laboean Talang P. Poene (p. Moersala).
21	<i>Gonystylus forbesii</i>	BO-1405902	Galoeng, A.H.	54	Sumatra, Tapanuli Ond afd Sibalga Aek Laboean Talang. P. Poene (P. Moersala)

Continued.

No.	Species	BO No.	Collector	Coll. No.	Locality
22	<i>Gonystylus forbesii</i>	BO-0083796	Galoeng, A.H.	65	Sumatra, Tapanuli Ond Afd. Sibolga Koealo Poelo Tjambe. P. Poenei (P. Moersala).
23	<i>Gonystylus forbesii</i>	BO-1601426	Galoeng, A.H.	65	Sumatra, Tapanuli Ond Afd. Sibolga Koealo Poelo Tjambe. P. Poenei (P. Moersala).
24	<i>Gonystylus forbesii</i>	BO-1405909	Pasariboe, P.	16	Sumatra, W. kust. Fort afd Capellen. Sg. Tolang.
25	<i>Gonystylus forbesii</i>	BO-0083793	Pasariboe, P.	16	Sumatra, W. kust. Fort afd Capellen. Sg. Tolang.
26	<i>Gonystylus forbesii</i>	BO-0083791	Pasariboe, P.	16	Sumatra, W. kust. Fort afd Capellen. Sg. Tolang.
27	<i>Gonystylus forbesii</i>	BO-1405908	Pasariboe, P.	16	Sumatra, W. kust. Fort afd Capellen. Sg. Tolang.
28	<i>Gonystylus forbesii</i>	BO-1406089	Pasariboe, P.	16	Sumatra, W. kust. Fort afd Capellen. Sg. Tolang.
29	<i>Gonystylus forbesii</i>	BO-1405907	Pasariboe, P.	16	Sumatra, W. kust. Fort afd Capellen. Sg. Tolang.
30	<i>Gonystylus forbesii</i>	BO-0083792	Pasariboe, P.	16	Sumatra, W. kust. Fort afd Capellen. Sg. Tolang.
31	<i>Gonystylus forbesii</i>	BO-1405906	Pasariboe, P.	16	Sumatra, W. kust. Fort afd Capellen. Sg. Tolang.
32	<i>Gonystylus forbesii</i>	BO-1601424	Hotta, M.	25480	Sumatra, west Sumatra: Bt. Gajabuih, Ulu Gadut, about 15 km east from Padang City. In Ulu gadut plot I.
33	<i>Gonystylus forbesii</i>	BO-0083783	Besar, S.M.	33	Sumatra, Westkast Ond. Afd. Painan Baroeng Balantai.
34	<i>Gonystylus forbesii</i>	BO-0083790	Besar, S.M.	33	Sumatra, Westkast Ond. Afd. Painan Baroeng Balantai.
35	<i>Gonystylus forbesii</i>	BO-0083785	Katarnida	8	Sumatra, S.W.K. Mentawai- eil P. Siberoet Saberoet.
36	<i>Gonystylus forbesii</i>	BO-1665955	Arbain, D.	DA-413	Sumatra, W. Sumatra, Rimbo panjang Tapi (G. Sago).
37	<i>Gonystylus forbesii</i>	BO-1601425	Hotta, M.	25302	Sumatra, west Sumatra: Bt. Gajabuih, Ulu Gadut, about 15 km east from Padang City. In Ulu Gadut Plot I.
38	<i>Gonystylus forbesii</i>	BO-1601429	Rossum, van	33	Sumatra.
39	<i>Gonystylus forbesii</i>	BO-1629271	Boschproefstation	15 T1P 17	Sumatra. Palembang
40	<i>Gonystylus macrophyllus</i>	BO-1402535	Achmad	979	Sumatra, Atjeh en Ond, Ond Afd, Semalur, P.Simalur.
41	<i>Gonystylus macrophyllus</i>	BO-0083698	Thabranie, M.	42	Sumatra, Atjeh en Tingkel, Boetar.
42	<i>Gonystylus macrophyllus</i>	BO-0083701	Wilde, W.J.J.O. de & Wilde-Duyfjes, B.E.E. de	13749	Sumatra, Gunung Ketambe and vicinity 8-15 km SW from the mouth of Lau Ketambe, c.40 km NW of Kutatjane.
43	<i>Gonystylus macrophyllus</i>	BO-0083696	Wilde, W.J.J.O. de & Wilde-Duyfjes, B.E.E. de	14049	Sumatra, Gunung Ketambe and vicinity 8-15 km SW from the mouth of Lau Ketambe, c.40 km NW of Kutatjane.

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No.	Species	BO No.	Collector	Coll. No.	Locality
44	<i>Gonystylus macrophyllus</i>	BO-0083695	Wilde, W.J.J.O. de & Wilde-Duyfjes, B.E.E. de	14049	Sumatra, Gunung Ketambe and vicinity 8-15 km SW from the mouth of Lau Ketambe, c.40 km NW of Kutajane.
45	<i>Gonystylus macrophyllus</i>	BO-0083700	Wilde, W.J.J.O. de & Wilde-Duyfjes, B.E.E. de	13679	Sumatra, Gunung Ketambe and vicinity, 8-15 km SW the mouth of Lau Ketambe, c.40 km Nw Kutajane.
46	<i>Gonystylus macrophyllus</i>	BO-0083697	Gusdorf, H.A.	s.n.	Sumatra, Lampongsche Districten, Semangka, Koeta Agoeng.
47	<i>Gonystylus macrophyllus</i>	BO-0083707	Teysmann	3697 H.B.	Sumatra, Palembang, Batoe Radja.
48	<i>Gonystylus macrophyllus</i>	BO-0083706	Diepenhorst	2356 H.B.	Sumatra, Priaman.
49	<i>Gonystylus macrophyllus</i>	BO-0083705	Diepenhorst	2356 H.B.	Sumatra, Priaman.
50	<i>Gonystylus macrophyllus</i>	BO-0083710	Thabranie, M.	42	Sumatra, Res. Atjeh en Ond, Ond Afd, Singkel Boetar.
51	<i>Gonystylus macrophyllus</i>	BO-0083709	Karamida	29	Sumatra, S.W.Mentawai Eilanden, Ladang, P. Siberoet.
52	<i>Gonystylus macrophyllus</i>	BO-0083708	Achmad	979	Sumatra, Simalur.
53	<i>Gonystylus macrophyllus</i>	BO-1402536	Achmad	979	Sumatra, Simalur.
54	<i>Gonystylus macrophyllus</i>	BO-0083699	Sahiboe	3	Sumatra, Westkust, Ond Agam, Batas Tjoeli.
55	<i>Gonystylus macrophyllus</i>	BO-1400750	Mol, D.	55	Sumatra, Ziouw en Ond. Koeantan districhten, Soengei Besar.
56	<i>Gonystylus macrophyllus</i>	BO-0083704	leg. ign.	s.n.	Sumatra.
57	<i>Gonystylus macrophyllus</i>	BO-0083703	leg. ign.	s.n.	Sumatra.
58	<i>Gonystylus macrophyllus</i>	BO-0083702	leg. ign.	s.n.	Sumatra.
59	<i>Gonystylus maingayi</i>	BO-0083712	Zwaan, C.J. van der	T 3 P.552	Sumatra, Res. Palembang, onderafd. Lemalang-Iilir.doesoen G. Megang.
60	<i>Gonystylus maingayi</i>	BO-0083711	Zwaan, C.J. van der	T 3 P.552	Sumatra, Res. Palembang, onderafd. Lemalang-Iilir.doesoen G. Megang.
61	<i>Gonystylus maingayi</i>	BO-1676019	Wilde, W.J.J.O. de & Wilde-Duyfjes, B.E.E. de	21302	Sumatra, sekundur Foret Reserve, upper Besitang river area, Langkat; base camp at Aras Napal.
62	<i>Gonystylus maingayi</i>	BO-1675610	Burley, J.S. & Tukirin et al.	1594	Sumatra, Tigapulu Mts., Riau Province, 5 km W of Talanglakat on Rengat-Jambi Road, Bukit Karampal area.
63	<i>Gonystylus maingayi</i>	BO-1675612	Burley, J.S. & Tukirin et al.	1578	Sumatra, Tigapulu, Mts., Riau Province, 5 km W of Talanglakat on Rengat-Jambi Road, Bukit Karampal area.
64	<i>Gonystylus maingayi</i>	BO-1675621	Burley, J.S. & Tukirin et al.	1578	Sumatra, Tigapulu, Mts., Riau Province, 5 km W of Talanglakat on Rengat-Jambi Road, Bukit Karampal area.
65	<i>Gonystylus sp.</i>	BO-1405953	Badroen	b.b.2582	Sumatra, Atjeh, Afd. Langsa.

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No.	Species	BO No.	Collector	Coll. No.	Locality
66	<i>Gonystylus sp.</i>	BO-1405952	Harouw, G.F.	b.b.2560	Sumatra, Atjeh, Afd.Langsa.
67	<i>Gonystylus sp.</i>	BO-1405954	Harouw, G.F.	b.b.2560	Sumatra, Atjeh, Afd.Langsa.
68	<i>Gonystylus sp.</i>	BO-1405951	Hamzah	102	Sumatra, Belitoeng.
69	<i>Gonystylus sp.</i>	BO-0083933	Teysmann	s.n.	Sumatra, Lampongs.
70	<i>Gonystylus sp.</i>	BO-0083934	Teysmann	s.n.	Sumatra, Lampongs.
71	<i>Gonystylus sp.</i>	BO-1675651	Buwalda, P.	B.20	Sumatra, Res. Riouw (Indragiri) Onderafd. Ondr. Bovenlanden Moeara Pedjangki.
72	<i>Gonystylus sp.</i>	BO-1405949	Mol, D.	57	Sumatra, Riouw en Ond, Kuantan districten, Soegei Besar.
73	<i>Gonystylus sp.</i>	BO-1629278	Warrouw, G.F.	bb. 2560	Sumatra, Aceh
74	<i>Gonystylus velutinus</i>	BO-1405982	Oetoei, M.	65	Sumatra, Bangka, Z.O., Muntok.
75	<i>Gonystylus velutinus</i>	BO-1405983	Oetoei, M.	118	Sumatra, Bangka.
76	<i>Gonystylus velutinus</i>	BO-1405941	Rassum, van	33	Sumatra, Biliton.
77	<i>Gonystylus velutinus</i>	BO-1405940	Rassum, van	33	Sumatra, Biliton.
78	<i>Gonystylus velutinus</i>	BO-1405942	Rassum, van	33	Sumatra, Biliton.
79	<i>Gonystylus velutinus</i>	BO-1405948	Zwaan, C.J. van der	15.T.IP.17.	Sumatra, Palembang, Banjoeasin en Koeboestrecken Bajoeng Lintjie.
80	<i>Gonystylus velutinus</i>	BO-1405943	Dorst, C.J.W.	15 T.P.21	Sumatra, Palembang, Banjoeasin en Koeboestrecken Bajoeng Lintjir.
81	<i>Gonystylus velutinus</i>	BO-1405973	Boschproefstation	T.812	Sumatra, Palembang, Lematang Ilir.
82	<i>Gonystylus velutinus</i>	BO-1601490	Zwaan, C.J. van der	J.3 g.812	Sumatra, Palembang, Lematang Ilir.Goenoeng Megang.
83	<i>Gonystylus velutinus</i>	BO-1601489	Zwaan, C.J. van der	J.3 g.812	Sumatra, Palembang, Lematang Ilir.Goenoeng Megang.
84	<i>Gonystylus velutinus</i>	BO-1601488	Paho	7	Sumatra, Palembang, Moesi Ilir, Koeboenstreken, Mangsang.
85	<i>Gonystylus velutinus</i>	BO-1675667	leg. ign.	s.n.	Sumatra, Res Palembang.
86	<i>Gonystylus velutinus</i>	BO-1405944	Mesurip	85	Sumatra, Res.Bengkulen, Ond.Afd Redjang Loeboek Bindjai.
87	<i>Gonystylus velutinus</i>	BO-1601487	Boschproefstation	T.21	Sumatra, Res.Palembang, Ond.Afd, Banjoeasin en Koeboestrecken.
88	<i>Gonystylus velutinus</i>	BO-1405974	Boschproefstation	T.21	Sumatra, Res.Palembang, Ond.Afd, Bankoeasin en Koeboes.

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No.	Species	BO No.	Collector	Coll. No.	Locality
89	<i>Gonystylus velutinus</i>	BO-1405946	Thorenaar, A.	15.T.IP.17.	Sumatra, Res.Palembang, Ond.Banjoeasin en Koeboestrecken bij Bajoeng Litjin.
90	<i>Gonystylus velutinus</i>	BO-1405947	Thorenaar, A.	15.T.IP.17.	Sumatra, Res.Palembang, Ond.Banjoeasin en Koeboestrecken bij Bajoeng Litjin.
91	<i>Gonystylus velutinus</i>	BO-1405945	Thorenaar, A.	15.T.IP.17.	Sumatra, Res.Palembang, Ond.Banjoeasin en Koeboestrecken bij Bajoeng Litjin.

Celebes

No.	Species	BO No.	Collector	Coll. No.	Locality
1	<i>Gonystylus macrophyllus</i>	BO-1675632	Boeadi	16	Celebes, C. Celebes, Soladih.
2	<i>Gonystylus macrophyllus</i>	BO-1405920	Pandeiroot, H.F.	5	Celebes, Manado, Kolonodali, Bahomotefe.
3	<i>Gonystylus macrophyllus</i>	BO-1675633	Teysmann	12087	Celebes, Pangkadjene
4	<i>Gonystylus macrophyllus</i>	BO-1675630	Teysmann	12087	Celebes, Pangkadjene
5	<i>Gonystylus macrophyllus</i>	BO-1675628	Teysmann	12087	Celebes, Pangkadjene
6	<i>Gonystylus macrophyllus</i>	BO-1665951	Teysmann	12087	Celebes, Pangkadjene.
7	<i>Gonystylus macrophyllus</i>	BO-1601467	Lam, H.J.	2906	Celebes, Talaud, Karakelang.
8	<i>Gonystylus macrophyllus</i>	BO-1601471	Lam, H.J.	2856	Celebes, Talaud.
9	<i>Gonystylus macrophyllus</i>	BO-1601469	Lam, H.J.	2856	Celebes, Talaud.
10	<i>Gonystylus macrophyllus</i>	BO-1601470	Lam, H.J.	2856	Celebes, Talaud.
11	<i>Gonystylus macrophyllus</i>	BO-1601472	Lam, H.J.	2856	Celebes, Talaud.
12	<i>Gonystylus macrophyllus</i>	BO-1601468	Lam, H.J.	2906	Celebes, Talaud.
13	<i>Gonystylus macrophyllus</i>	BO-1675631	Meijer, W.	10854	Celebes, Sw peninsula, Ne of Makassar within 54-60 km on the road.
14	<i>Gonystylus sp.</i>	BO-1675652	Vogel, E.F. de	6197	Celebes, South Sulawesi, NE shore of Lake Matano, Seluro, E. of Nuha and Bonemaitu.

Moluccas

No.	Species	BO No.	Collector	Coll. No.	Locality
1	<i>Gonystylus macrophyllus</i>	BO-0083689	Buwalda, P.	285	Molukken, Aroe eilanden, Dositamalaoet, P.Kobroor.
2	<i>Gonystylus macrophyllus</i>	BO-1601481	Buwalda, P.	285	Molukken, Aroe eilanden, Dositamalaoet, P.Kobroor.
3	<i>Gonystylus macrophyllus</i>	BO-0083690	Buwalda, P.	261	Molukken, Ond Afd Aroe eilanden, Dosi nagnalaoe, P. Kobroor.
4	<i>Gonystylus macrophyllus</i>	BO-1601482	Buwalda, P.	261	Molukken, Ond Afd Aroe eilanden, Dosi nagnalaoe, P. Kobroor.
5	<i>Gonystylus macrophyllus</i>	BO-1601479	Buwalda, P.	582	Molukken, Ond Afd Oost Ceram, Kilandararail. Ceram.
6	<i>Gonystylus macrophyllus</i>	BO-0083688	Buwalda, P.	582	Molukken, Ond Afd Oost Ceram, Kilandararail. Ceram.
7	<i>Gonystylus macrophyllus</i>	BO-1601480	Bloembergen, S.	468	Molukken, Soela Eilanden Kimakol, Lampaoe.
8	<i>Gonystylus macrophyllus</i>	BO-1675636	Haan, G. de	412	Molukken, Tabelo, G. Baroe, Baroe. Eil. Morotai.

Papua & West Papua

No.	Species	BO No.	Collector	Coll. No.	Locality
1	<i>Gonystylus macrophyllus</i>	BO-1675641	Moll, V.W.	BW.9889	New Guinea, Adi island, Kaimana distr.
2	<i>Gonystylus macrophyllus</i>	BO-1675642	Moll, V.W.	BW.9889	New Guinea, Adi island, Kaimana distr.
3	<i>Gonystylus macrophyllus</i>	BO-1629276	Streimann, H.	24278	New Guinea
4	<i>Gonystylus macrophyllus</i>	BO-1675625	Pullen, R.	7485	New Guinea, Kaim River, NE, Lake murray area.
5	<i>Gonystylus macrophyllus</i>	BO-1675624	Iwanggin, G.T.	BW.10161	New Guinea, Netherlands New Guinea, Div. Fak-fak, Adi isl.
6	<i>Gonystylus macrophyllus</i>	BO-0083691	Pulle, A.	390	New Guinea.
7	<i>Gonystylus sp.</i>	BO-1675967	Laumonier	TFB.3782	New Guinea, Irian Jaya, Memberamo river.
8	<i>Gonystylus sp.</i>	BO-0014497	Laumonier	TFB.3748	New Guinea, Irian Jaya, Memberano river.
9	<i>Gonystylus sp.</i>	BO-1350052	Balgooy, M.M.J. van	6808	New Guinea, Kepulauan Aru, Pulau Koba
10	<i>Gonystylus sp.</i>		Laumonier	TFB3782	New Guinea, Trimuris, Memberamo river

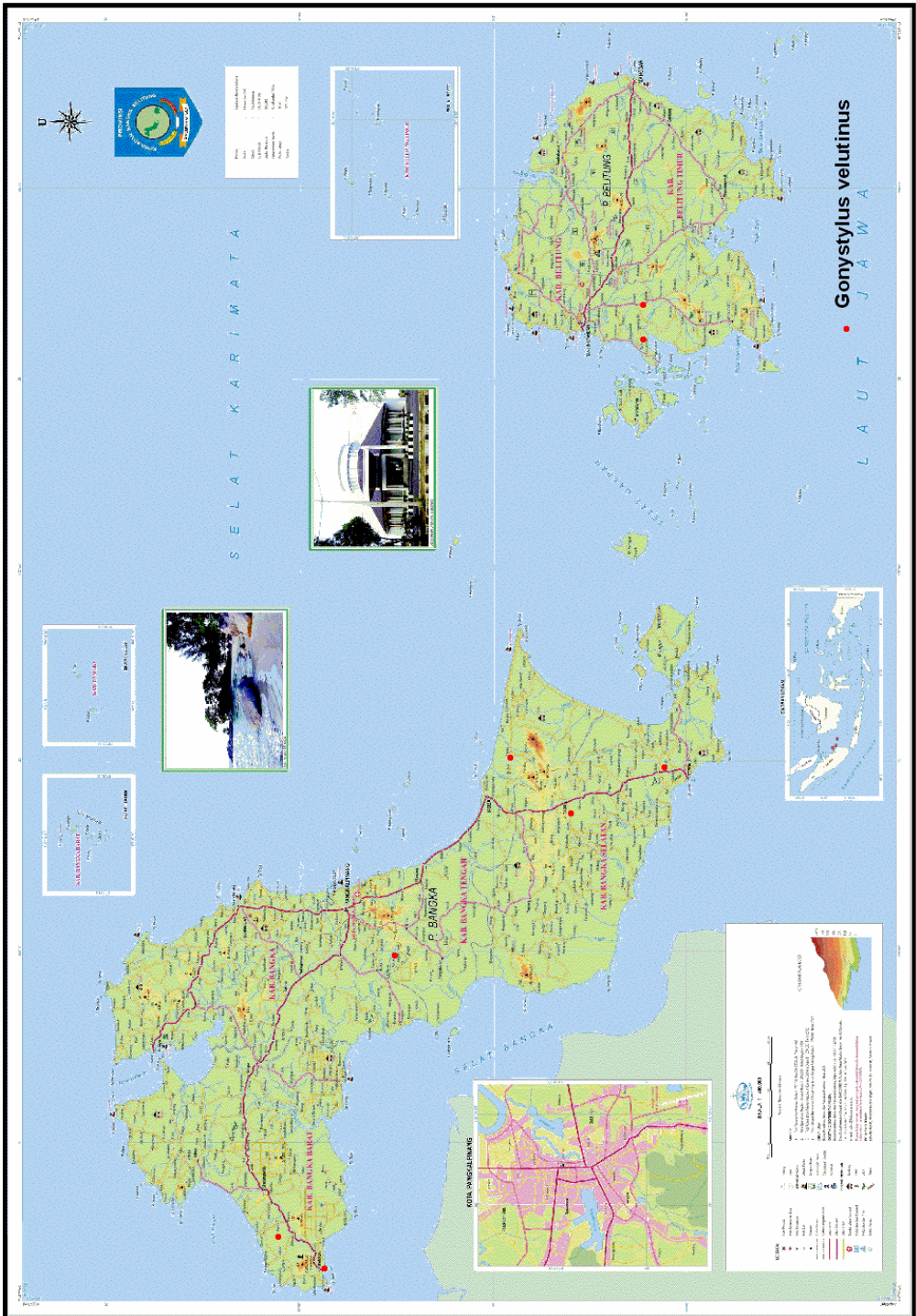
Java & Flores

No.	Species	BO No.	Collector	Coll. No.	Locality
1	<i>Gonystylus macrophyllus</i>	BO-0083672	Koorders, S.H.	15742 β	Java, Lemboer Tji, Odjoeng distr, Laboean, Soekaboemi.
2	<i>Gonystylus macrophyllus</i>	BO-0083683	Koorders	13490	Java, Pekalongan, Soebah.
3	<i>Gonystylus macrophyllus</i>	BO-1675971	Koorders	13490 β	Java, Pekalongan, Soebah.
4	<i>Gonystylus macrophyllus</i>	BO-0083682	Koorders	13490 β	Java, Pekalongan, Soebah.
5	<i>Gonystylus macrophyllus</i>	BO-0083674	Koorders	1145 β	Java, Preanger, Soekaboemi, Palaboeanratoe.
6	<i>Gonystylus macrophyllus</i>	BO-0083676	Koorders	15742 β	Java, Preanger, Soekaboemi, Palaboeanratoe.
7	<i>Gonystylus macrophyllus</i>	BO-0083669	Koorders, S.H.	1145 β	Java, Preanger.
8	<i>Gonystylus macrophyllus</i>	BO-0083670	Koorders, S.H.	1145 β	Java, Preanger.
9	<i>Gonystylus macrophyllus</i>	BO-1405966	Koorders	7510 β	Java, Res Bantam, Distr. Batoehideung Afd., G. Boentoeng.
10	<i>Gonystylus macrophyllus</i>	BO-1405965	Koorders	7510 β	Java, Res Bantam, Distr. Batoehideung Afd., G. Boentoeng.
11	<i>Gonystylus macrophyllus</i>	BO-0083677	Koorders, S.H.	3674 β	Java, Res. Pekalongan, Boschterrein Soebah.
12	<i>Gonystylus macrophyllus</i>	BO-0083678	Koorders, S.H.	3674 β	Java, Res. Pekalongan, Boschterrein Soebah.
13	<i>Gonystylus macrophyllus</i>	BO-0083673	Koorders	7496 β	Java, Res. Preanger, Afd. Soekaboemi, Palaboeanratoe Zuidkust.
14	<i>Gonystylus macrophyllus</i>	BO-1405964	Koorders	7562 β	Java, Res. Bantam. Afd Tjiringan Dst. Tjibaloeng.
15	<i>Gonystylus macrophyllus</i>	BO-0083687	Steenis, C.G.G.J. van	11186	Java, Res. Batavia Bantam, Jasinga Estate, Doengoes Iwoel
16	<i>Gonystylus macrophyllus</i>	BO-1384336	Wirawan, N.	407	Java, S. W. Java, Ujung Kulon Nature Reserve, Peutjang Island.
17	<i>Gonystylus macrophyllus</i>	BO-1582920	Wirawan, N.	343	Java, S.W. Java, Ujung Kulon Nature Reserve, Mt. Pajung.
18	<i>Gonystylus macrophyllus</i>	BO-1601477	Wirawan, N.	407	Java, S.W. Java, Ujung Kulon Nature Reserve, Peutjang isl.
19	<i>Gonystylus macrophyllus</i>	BO-0083680	Koorders, S.H.	23934 β	Java, Soebah.
20	<i>Gonystylus macrophyllus</i>	BO-1405923	Koorders, S.H.	14241 β	Java, Subah.
21	<i>Gonystylus macrophyllus</i>	BO-1601476	Hildebrand, F.H.	155	Java, West Java, Buitenzorg, N.M. Doengoes Iwoel (Tjigeloeng).
22	<i>Gonystylus macrophyllus</i>	BO-1405924	leg. ign.	Ja.1041	Java, West Java, Buitenzorg.
23	<i>Gonystylus macrophyllus</i>	BO-0083686	Harris, M.	1	Java, West Java, Ond. Afd Lebak, Soekaradja (Malungpeng).
24	<i>Gonystylus macrophyllus</i>	BO-1601478	Harris, M.	1	Java, West Java, Ond. Afd, Lebak, Kandang Sapi, Garoeng.

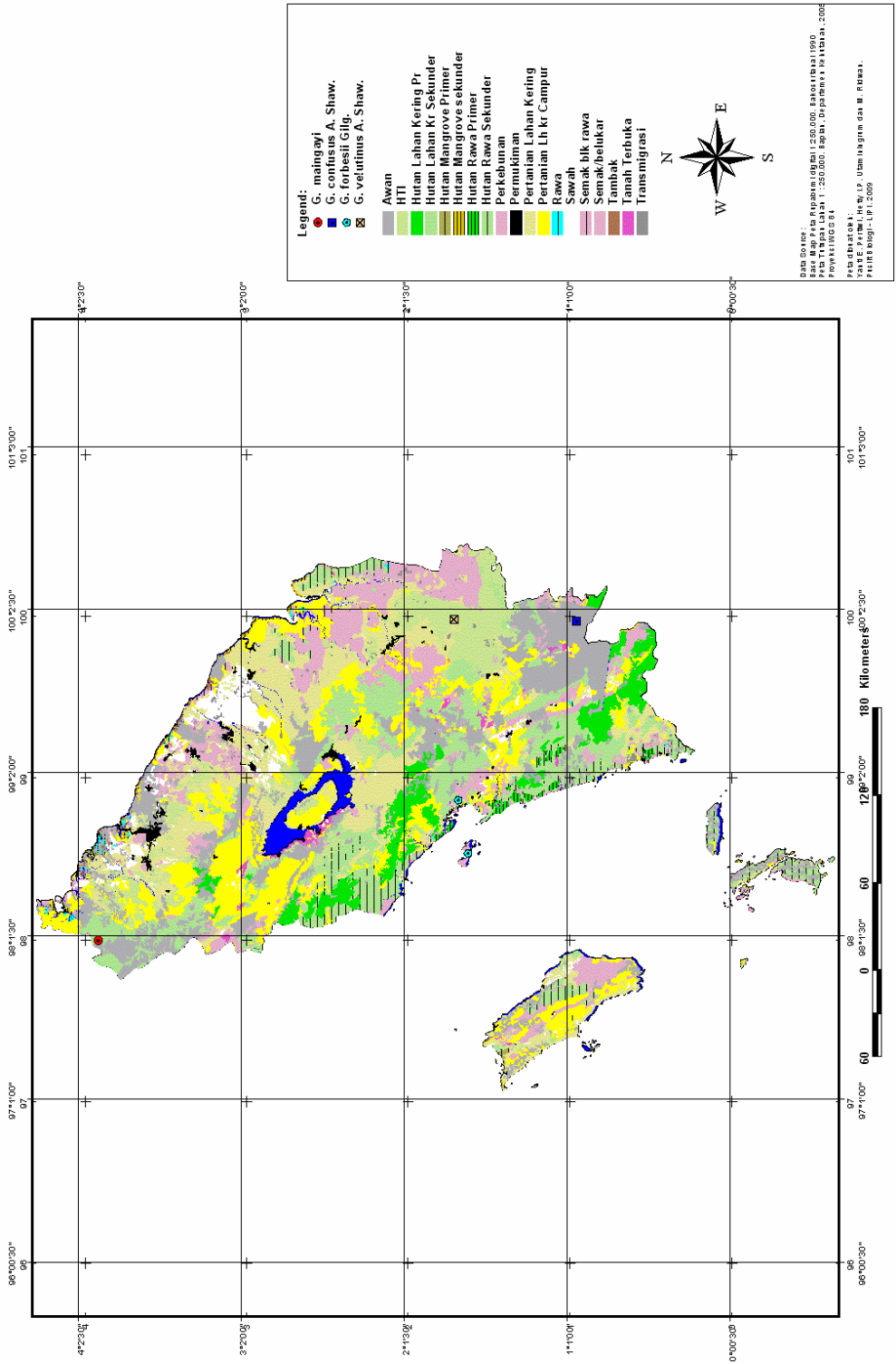
Continued.

No.	Species	BO No.	Collector	Coll. No.	Locality
25	<i>Gonystylus macrophyllus</i>	BO-0083685	Koorders	23934 ß	Java.
26	<i>Gonystylus macrophyllus</i>	BO-1675627	leg. ign.	2882 H.B.	Java.
27	<i>Gonystylus macrophyllus</i>	BO-0083684	Koorders	13490 ß	Java.
28	<i>Gonystylus macrophyllus</i>	BO-1675629	leg. ign.	2882 H.B.	Java.
29	<i>Gonystylus macrophyllus</i>	BO-0083679	Koorders, S.H.	13490 ß	Java.
30	<i>Gonystylus macrophyllus</i>	BO-0083675	Koorders	1145 ß	Java.
31	<i>Gonystylus macrophyllus</i>	BO-1405964	Koorders, S.H.	7562ß	Java. G. Teloe boven tarikolot.
32	<i>Gonystylus macrophyllus</i>	BO-1629275	Steenis, C.G.G.J. van	11186	Java. Jasinga
33	<i>Gonystylus sp.</i>	BO-1629279	Koorders	s.n.	Java. Banyuwangi
34	<i>Gonystylus macrophyllus</i>	BO-1675634	Schmutz, P.E.	2837	Flores

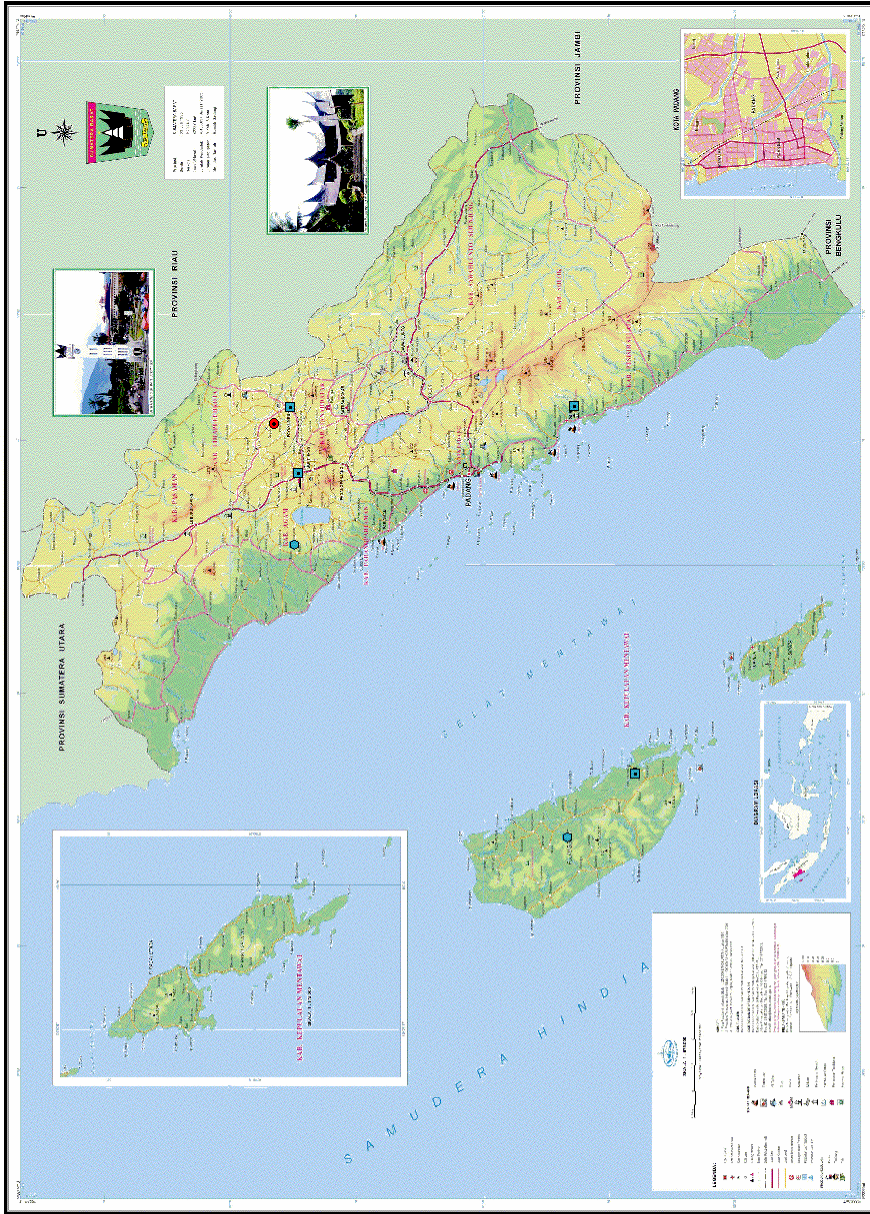
PROVINSI KEPULAUAN BANGKA BELITUNG



Peta Sebaran Koleksi *Gonystylus* di Provinsi Sumatra Utara



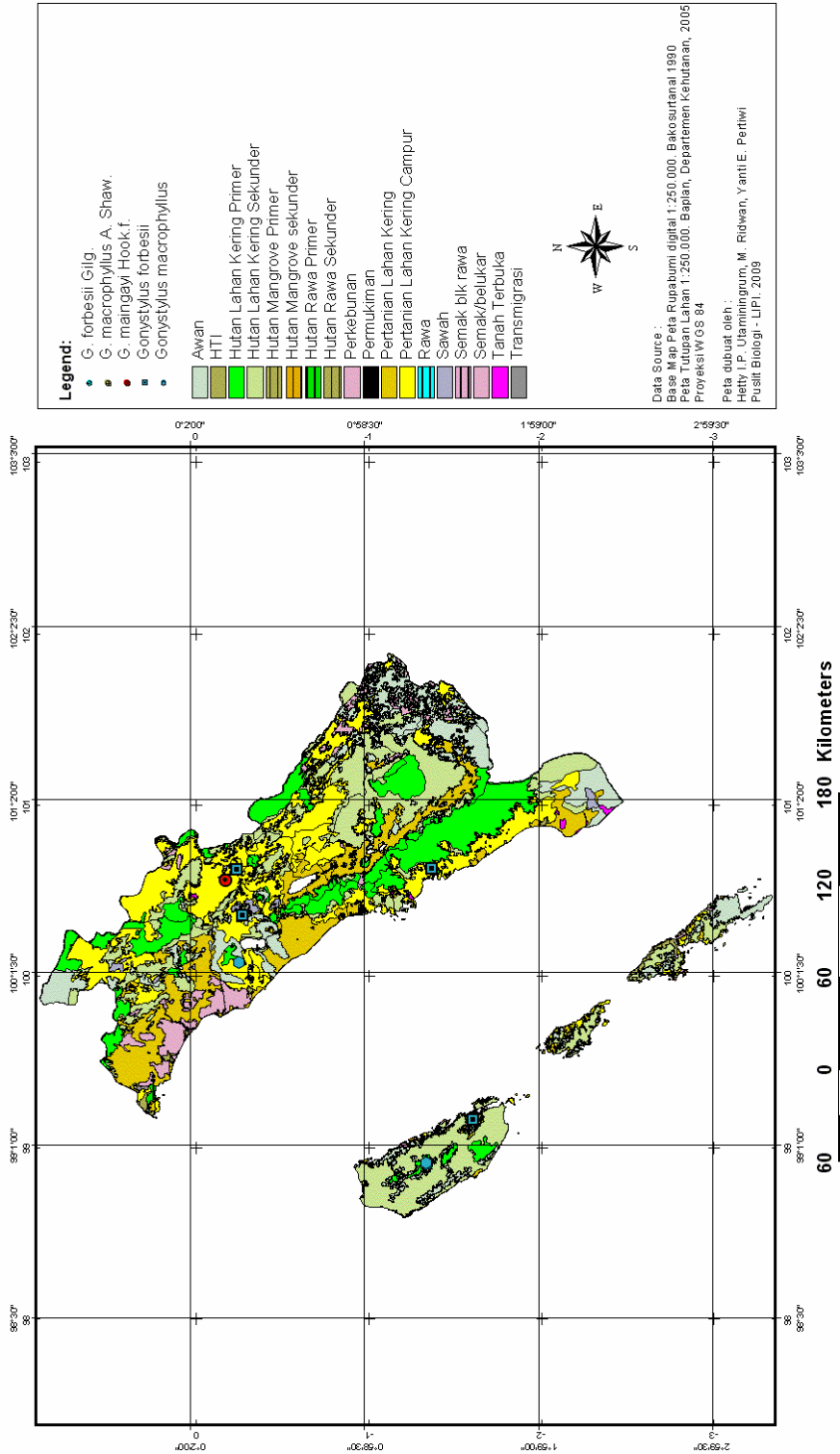
PROVINSI SUMATERA BARAT



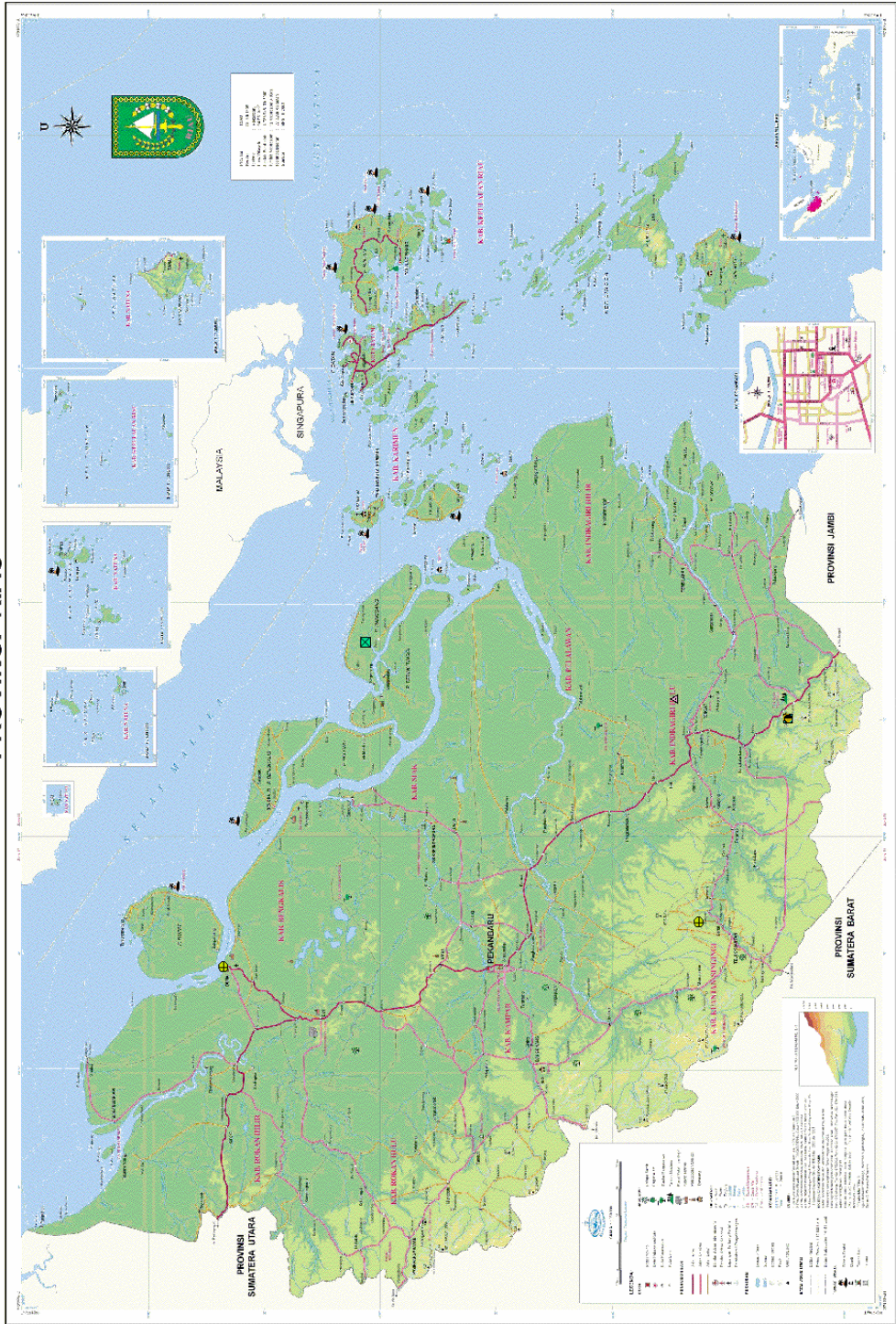
Legend

- G. forbesii* Gilg.
- G. macrophyllus* A. Shaw.
- G. maingayi* Hook f.
- Gonystylus forbesii*
- Gonystylus macrophyllus*

Peta Sebaran Koleksi *Gonystylus* di Propinsi Sumatera Barat

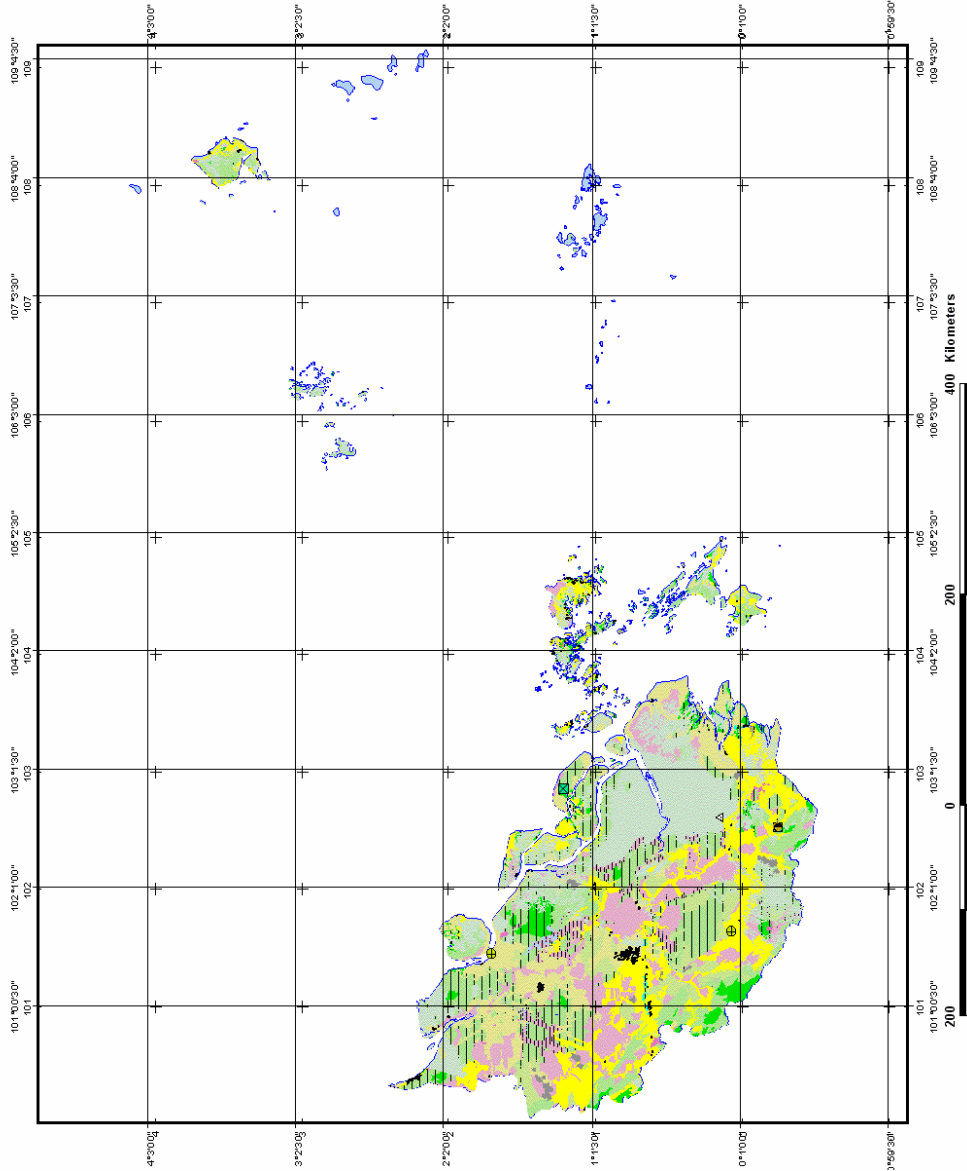


PROVINSI RIAU

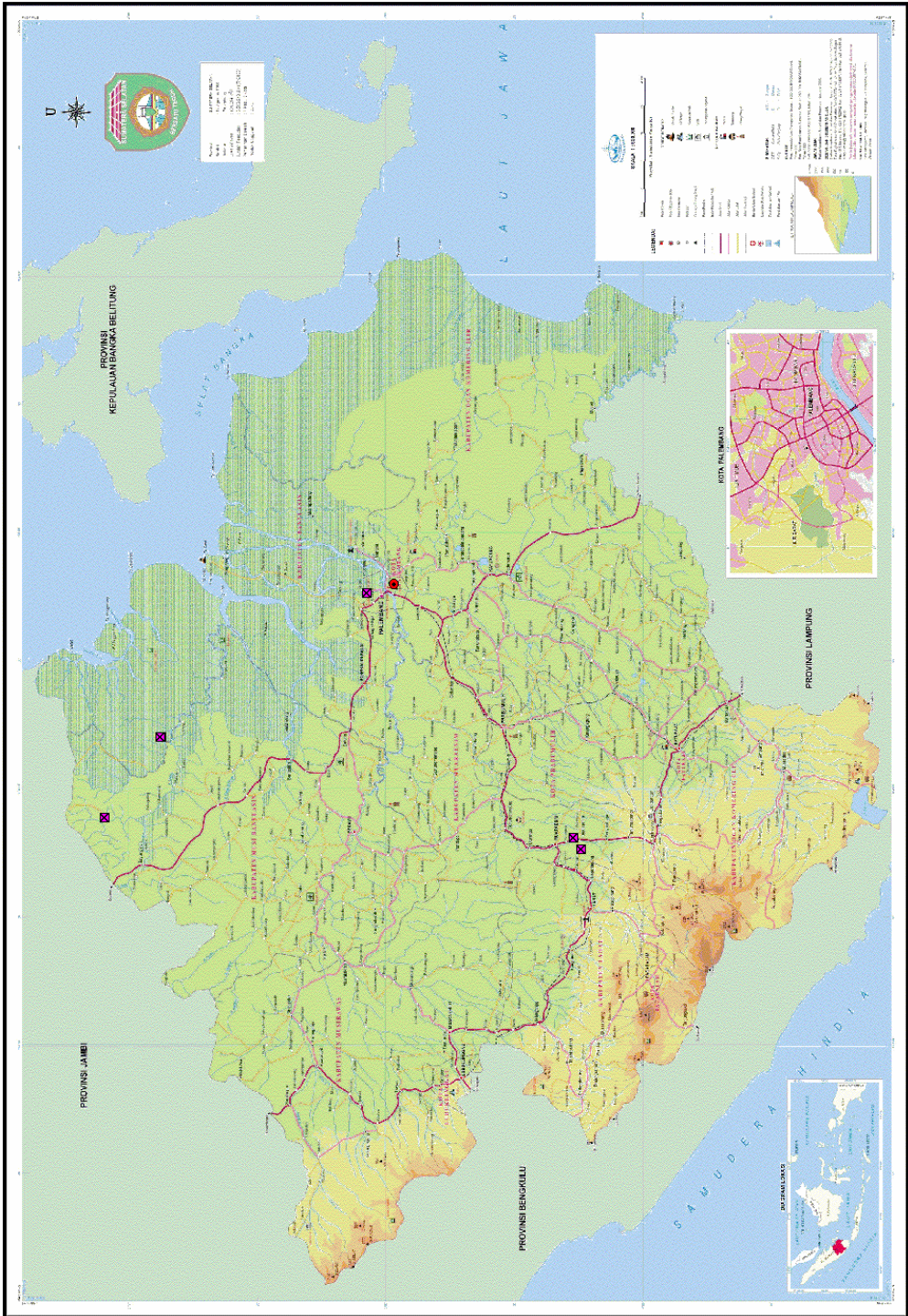


Legend:

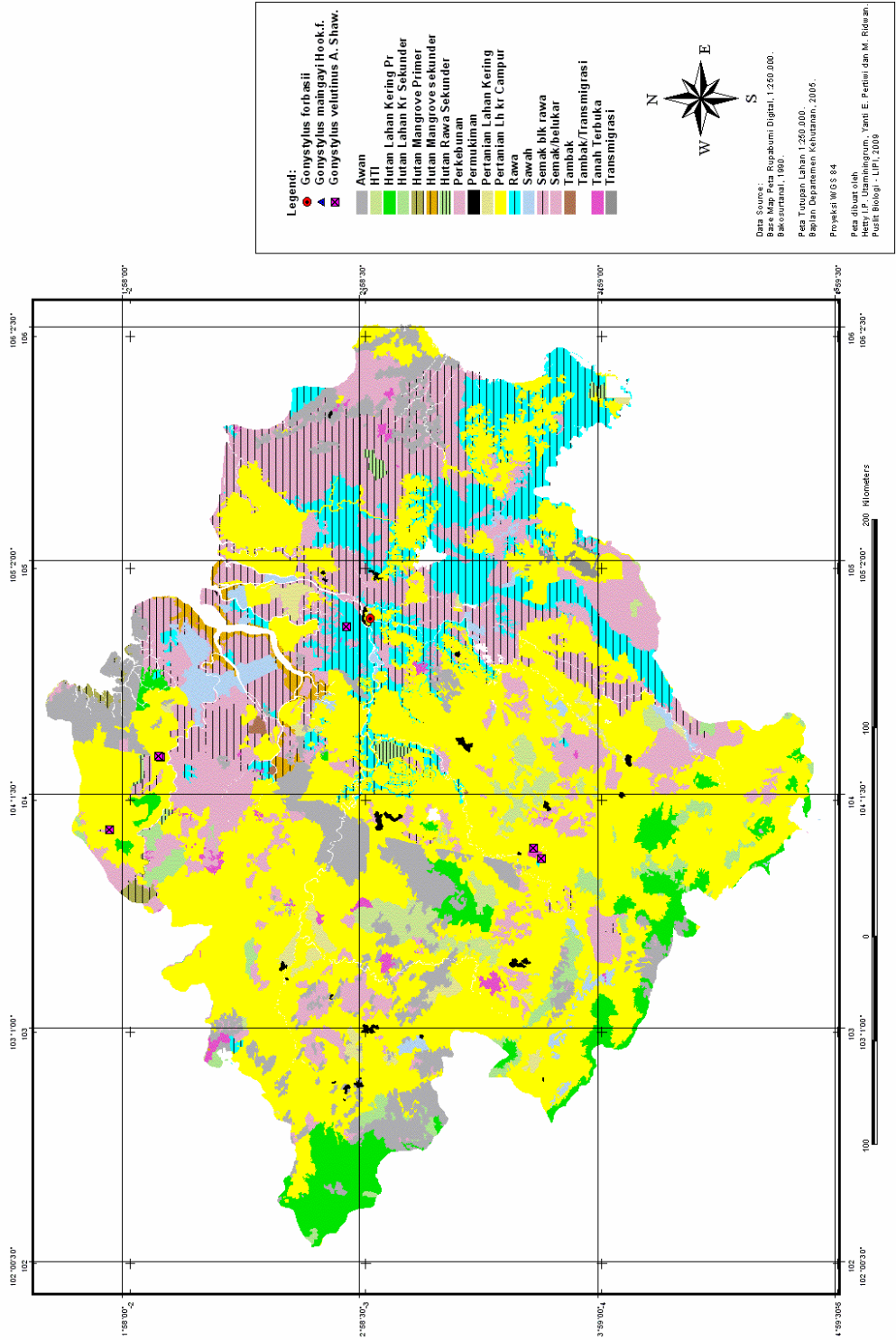
Peta Sebaran Koleksi *Gonystylus* di Provinsi Riau dan Riau Kepulauan



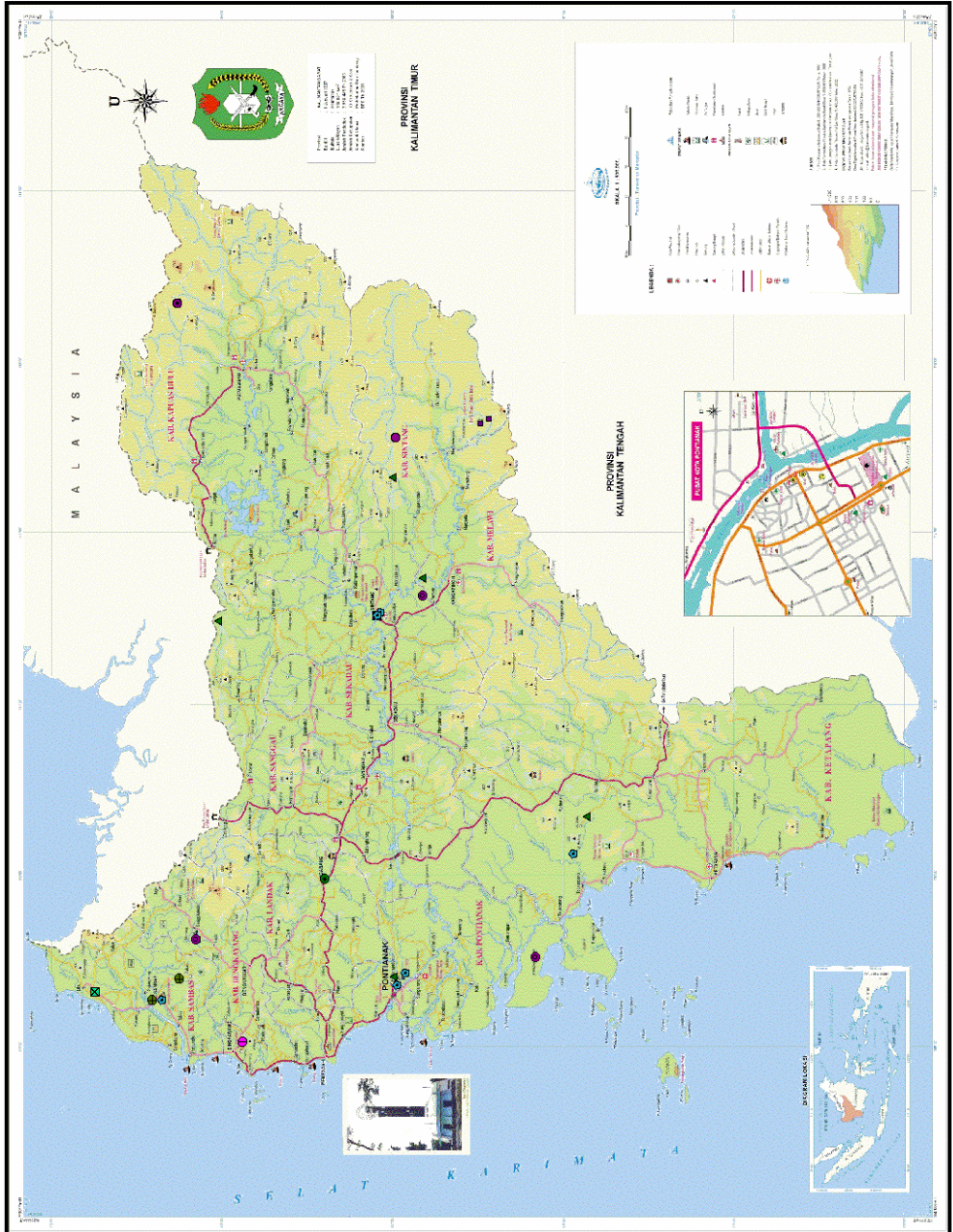
PROVINSI SUMATERA SELATAN



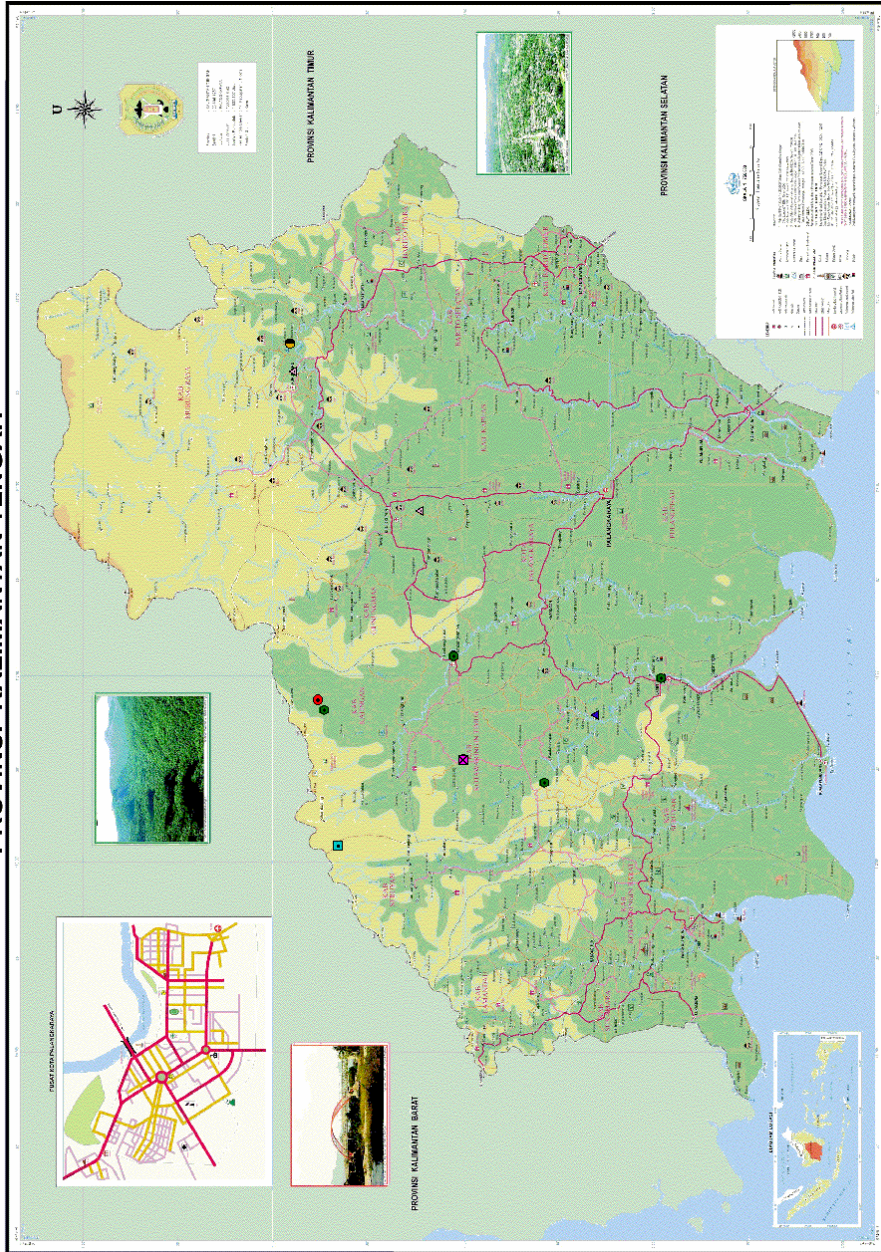
Peta Sebaran Koleksi *Gonystylus* di Provinsi Sumatera Selatan



PROVINSI KALIMANTAN BARAT

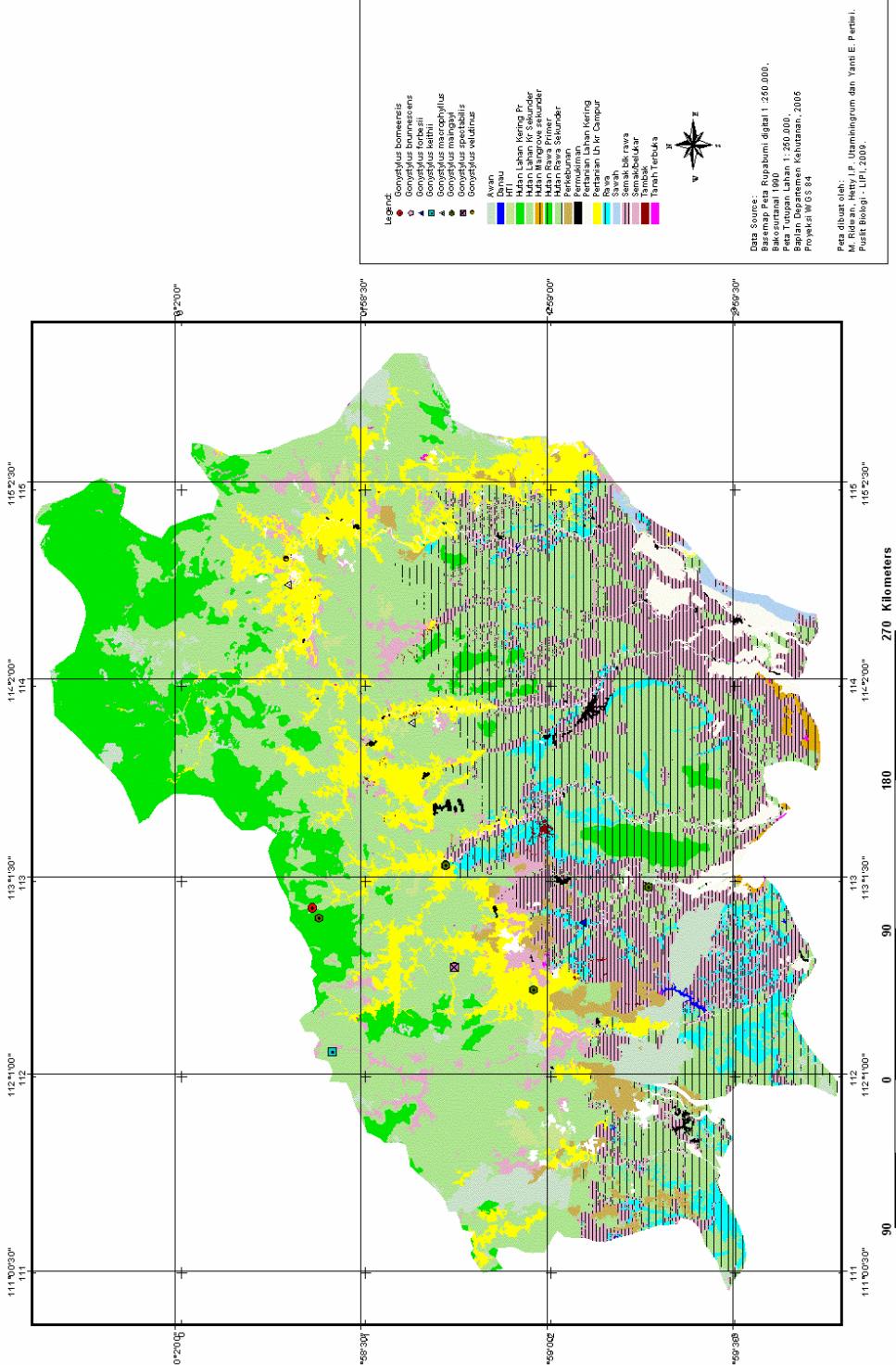


PROVINSI KALIMANTAN TENGAH

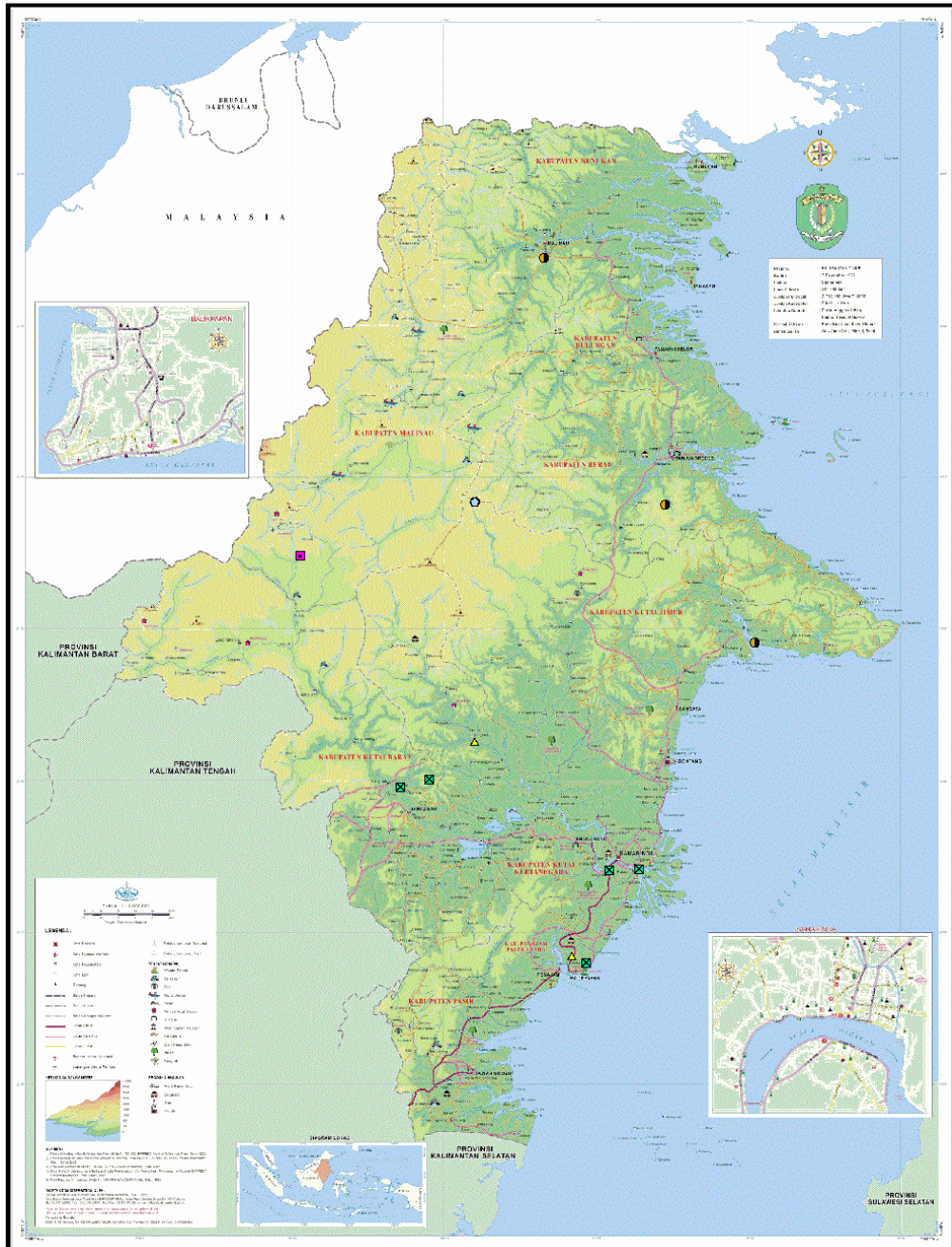


- Legend:**
- *Gonystylus borneensis*
 - *Gonystylus brunnescens*
 - ▲ *Gonystylus forbesii*
 - ▲ *Gonystylus keithii*
 - ▲ *Gonystylus macrophyllus*
 - ◆ *Gonystylus maingayi*
 - *Gonystylus spectabilis*
 - *Gonystylus velutinus*

Peta sebaran Koleksi *Gonystylus* di Provinsi Kalimantan Tengah

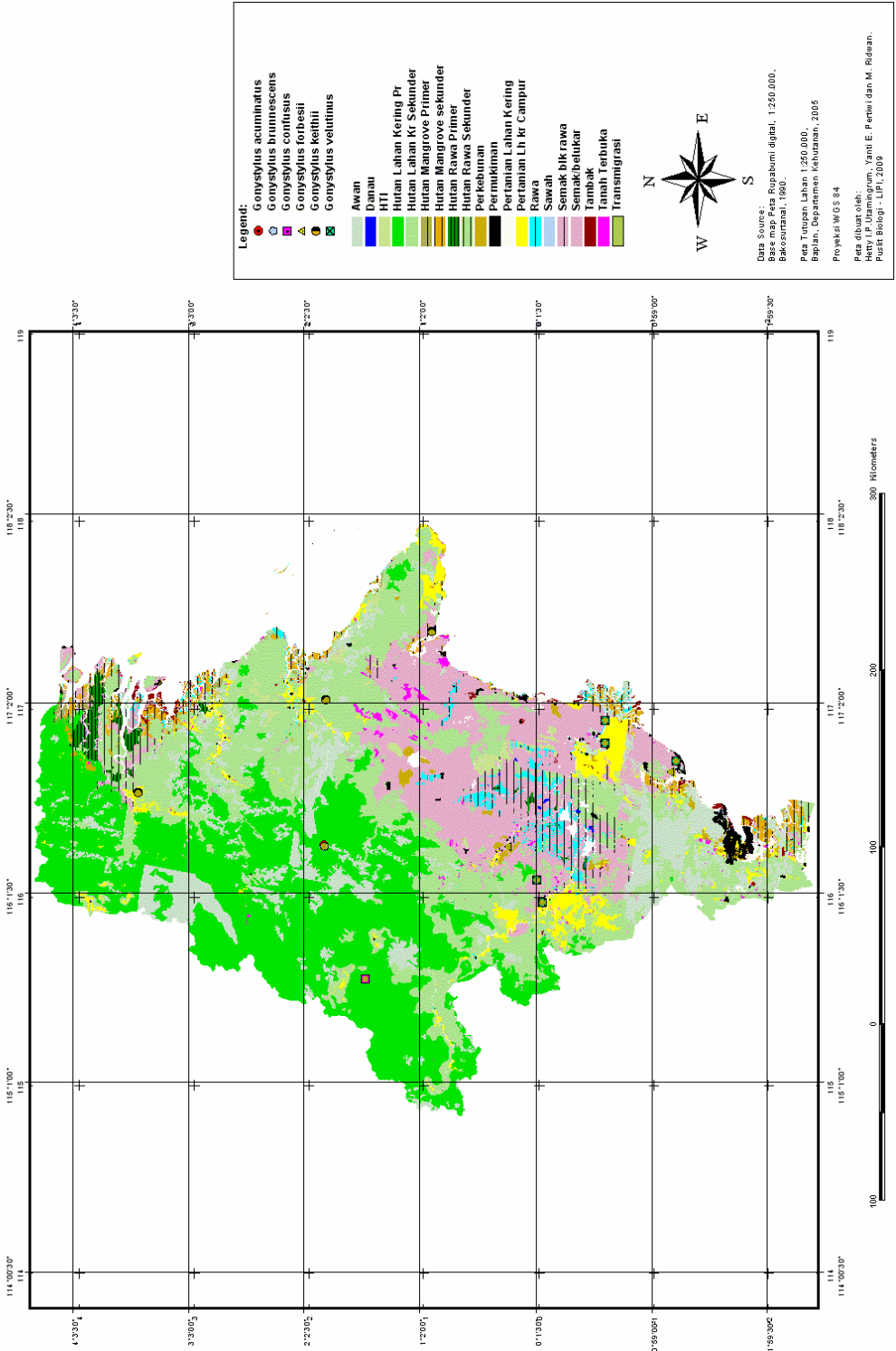


PROVINSI KALIMANTAN TIMUR



- Legend:**
- *Gonystylus acuminatus*
 - *Gonystylus brunescens*
 - *Gonystylus confusus*
 - ▲ *Gonystylus forbesii*
 - *Gonystylus keithii*
 - *Gonystylus velutinus*

Peta Sebaran Koleksi *Gonystylus* di Provinsi Kalimantan Timur





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