

THE RE-CONSIDERATION OF THE GENUS Cordia L.

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The genus Cordia L. (Boraginaceae) has been re-considered several times from taxonomical point of view. It was splitted into 10 genera by FRIESEN (1933), but at same time it was maintained as an undivided unit by the world monographist of the genus, I.M. JOHNSTON. Palynological studies of several authors suggested a new approach to the taxonomy of this group. More than 100 species of Cordia were submitted to a careful study in respect of pollen morphology and calyx structure and floral morphology. Results permit us to suggest the separation of three genera: Cordia L., Varronia P. Browne and Gerascanthus P. Browne and a number of new combinations correlated to these changes.

INTRODUCTION

Cordia L. is a highly variable genus of a pantropical distribution. Its different species were described in the framework of different genera by early classic authors like, PLUMIER, LINNÉ, P. BROWNE, RUIZ et PAVON.

The first review of the genus was made by DE CANDOLLE (1845), who distinguished two genera, Varronia DC. non P. BROWNE, including 3 species with calyx opening with circumcised calyptra, and Cordia Plum. with 5 sections: Gerascanthus Cham., Rhabdocalyx A. DC., Pilicordia A. DC., Physocla-da DC., Sebestenoides DC., Myxa Endl. and Cordiopsis A. DC. This concept was followed by GÜRKE in the *Natürlichen Pflanzenfamilien* (1893) with some modifications. In his treatment Varronia was included into Cordia as a section, and Cordiopsis has not been distinguished not even on a section level.

It is BRITTON, who starts dividing Cordia into several genera. After the intention of Millspaugh (1909) he also re-establishes Varronia of P. BROWNE (1914), than Sebesten of DILLENIUS (1918) and at last describes with MILLSPAUGH (1925) the genus Calyptrocordia, for distinguishing the species Cordia alba (Jacq.) Roem. et Schult. having a calyx opening with calyptra.

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FRIESEN (1933) went much farther in splitting *Cordia* and divided it into 10 genera: *Myxa* Friesen, *Collococcus* P. Browne, *Sebestena* Dillen, *Calyptrocordia* Britt. et Wils., *Varronia* P. Browne em. Friesen, *Varroniopsis* Friesen, *Montjolya* Friesen, *Ulmarriona* Friesen, *Gerascanthus* P. Browne, and *Cordiopsis* Desv. em. A. DC. In his cited work FRIESEN has elaborated only one of the ten genera, *Varronia*, in details.

In opposition to the "ultrarevolutionary" concept of FRIESEN, I.M. JOHNSTON occupied an extremely traditional standpoint by maintaining *Cordia* as a undividable unit, distinguishing only five sections within the framework of this pantropical genus: *Sebestena*, *Varronia*, *Gerascanthus*, *Pilicordia* and *Myxa*.

Just some years later than the last paper of JOHNSTON had appeared (1958) on *Cordia*, NOWICKE and RIDGWAY (1973) started to study the pollen morphology existing in the Boraginaceae family, including *Cordia* as well. They established that in the genus *Cordia* s.l. three different pollen types can be found (1973). MONCADA y HERRERA (1987) studied the pollen grains of 23 *Cordia* species of the Cuban flora, and they found four morphological types of the pollen grains. Their Type I included some species belonging to the section *Sebestena*, the Type II included a number of species of the section *Varronia*, the Type III turned to be common among the species of the sections *Gerascanthus* and *Myxa*, and the Type IV was found exclusively in one species: *Cordia alba*, representing the monotypic genus *Calyptrocordia* Britt. et Wils.

MATERIAL AND METHODS

Field experiences acquired by the first author both in the West Indies and East Africa inspired us to approach the problem from a new direction on a wider geographic and methodological base. Species originated from the Antilles and South America, and a number of African and Asian including some Oceanian taxa have been involved into the study. Besides SEM-micrographs of the pollen grains, floral anatomy with special attention to the opening of calyx, morphology of calyx lobes and to some floral biological features has been studied. More than 170 species were studied, originated partly from own recent collections and types or/and authentic specimens studied in the herbaria B, BP, K, and S.

Type materials of the following species were studied:

Cordia anderssonii Guerke
Cordia axillaris Johnston
Cordia badaeva Urb. et Ekm.
Cordia baracoensis Urb.
Cordia braceliniae Johnst.

Cordia chabrensis Urb. et Ekm.
Cordia claviceps Urb. et Ekm.
Cordia corallicola Urb.
Cordia duartei Borhidi et Muñiz
Cordia exarata Urb.
Cordia ewanii Killip
Cordia fasciculata Urb. et Ekm.
Cordia galapagensis Guerke
Cordia gibberosa Urb. et Ekm.
Cordia guarantiaca Chod. et Hassl.
Cordia iberica Urb.
Cordia jeremiensis Urb. et Ekm.
Cordia lamprophylla Urb.
Cordia llanorum Killip
Cordia lomatoloba Johnst.
Cordia mollissima Killip
Cordia nesophila Johnst.
Cordia opaca Rusby
Cordia paniculata Wikstr.
Cordia paraguariensis Chod. et Hassl.
Cordia petenensis Lundell
Cordia selleana Urb.
Cordia suffruticosa Borhidi
Cordia toaensis Borhidi et Muñiz
Cordia utermarkiana Borhidi

Authentic materials of the following species were studied:

Cordia abyssinica DC.
Cordia acuta Pittier
Cordia alba (Jacq.) Roem. et Schult.
Cordia alliodora (Ruiz et Pav.) Cham.
Cordia anisodonta Urb.
Cordia areolata Urb.
Cordia aspera Fort.
Cordia aurantiaca Baker
Cordia bellonis Urb.
Cordia bicolor A. DC.
Cordia bifurcata Roem. et Schult.
Cordia boissieri A. DC.
Cordia boliviana Gand.
Cordia borinquensis Urb.
Cordia brachycalyx Urb.
Cordia brittonii (Millsp.) Macbr.
Cordia brownei (Friesen) Johnst.
Cordia buchii Urb.
Cordia caffra Sond.
Cordia calcicola Urb.
Cordia chacoensis Chod.
Cordia chamissoniana Steud.
Cordia chaetodonta Melch.
Cordia chrysocarpa Baker
Cordia collococca L.
Cordia colombiana Killip
Cordia cujabensis Cham.
Cordia curassavica (Jacq.) Roem. et Schult.
Cordia dasycephala Desv.

Cordia decandra Hook. et Arn.
Cordia dichotoma Forst.
Cordia diversifolia Pav. ex DC.
Cordia dodecandra DC.
Cordia dwyeri Nowicke
Cordia ecalyculata Vell.
Cordia elliptica Sw.
Cordia ensifolia Urb.
Cordia eriostigma Pittier
Cordia exaltata Lam.
Cordia gerascanthus L.
Cordia gharaf Ehrenb. ex Aschers.
Cordia glabrata A. DC.
Cordia goeldiana Huber
Cordia goetzei Guerke
Cordia grandis Roxb.
Cordia graveolens HBK.
Cordia greggii Torr.
Cordia griffithii C.B. Clarke
Cordia hebeclada Johnst.
Cordia hermanniifolia Cham.
Cordia hypoleuca A. DC.
Cordia ignea Urb. et Ekm.
Cordia inermis Mill.
Cordia insignis Cham.
Cordia kanehirai Hayata
Cordia laevigata Lam.
Cordia lanata HBK.
Cordia latifolia Cham.
Cordia linnaei Stearn
Cordia lucidula Johnst.
Cordia lutea Lam.
Cordia macrantha Chod.
Cordia macrocephala HBK.
Cordia macrostachya (Jacq.) Roem et Schult.
Cordia magnoliifolia Cham.
Cordia megalantha Blake
Cordia microcarpa Killip
Cordia mirabiloides (Jacq.) Roem. et Schult.
Cordia monoica Roxb.
Cordia multispicata Cham.
Cordia myxa L.
Cordia nashii Urb. et Britt.
Cordia nodosa Lam.
Cordia obliqua Willd.
Cordia oblongifolia Thwait.
Cordia panamensis Riley
Cordia panicularis Rudge
Cordia parvifolia A. DC.
Cordia patens HBK.
Cordia paucidentata Fresen
Cordia perroyana Urb. et Ekm.
Cordia picardae Urb.
Cordia platythyrsa Baker
Cordia podocephala Torr.

Cordia poeppigii DC.
Cordia polyantha Benth.
Cordia pringlei Robins.
Cordia rickseckeri Millsp.
Cordia riparia HBK.
Cordia rosei Killip
Cordia rufescens A. DC.
Cordia rupicola Urb.
Cordia salicifolia Cham.
Cordia scaberrima HBK.
Cordia scabrifolia A. DC.
Cordia sebestena L.
Cordia sellowiana Cham.
Cordia sericalyx A. DC.
Cordia skutchii Johnst.
Cordia sprucei Mez
Cordia superba Cham.
Cordia silvestris auct.
Cordia tetrandra Aubl.
Cordia tortuensis Urb. et Ekm.
Cordia trichoclada A. DC.
Cordia trichotoma Vell.
Cordia verbenacea DC.
Cordia viridis (Rusby) Johnst.

RESULTS

Based on the multilateral studies described above, results permit us to draw the following conclusions. There are three major groups of the species to be distinguished both on floral morphological and palynological evidences at generic level. These are the followings:

Cordia L. em. Borhidi.

Cordia L. in Gen. Pl. ed. I. p. 52. 1737. p. p. No. 149. *Sebestena* Dillen. Hort. Eltham., II. p. 340-342. 1732. *Cordia* sect. *Sebestenoides* DC. Prodr. 9:476. 1845.; *Sebesten* Britt. Fl. Berm. p. 309. 1918. *Cordia* sect. *Eucordia* Johnst. Contr. Gray Herb. 92:41. 1930.

Trees and shrubs with terminal corymbose inflorescences, flowers large, showy, corolla tube longer than the calyx, calyx lobes 3-12, corolla lobes 5-16, stamens 5-16, anthers large, oblong, flowers morphologically and physiologically complete, bisexual, fruit large, calyx growing with the mature fruit and becoming fleshy. Pollen grains 3-colpate to 3-colporoidate, sexine reticulate-striate semitectate, colpi long to apocolpium. The striate-reticulate structure more dense around the colpi. Pollen grains loose, easily spreading, pollen kitts few or lacking.

The genus is mostly of neotropical distribution including about 20-25 species, most of them from the Caribbean, with one representative in the Palaeotropics. A preliminary list of the species belonging here:

Cordia L. em. Borhidi

- Sebestena Dillen. 1732, Adanson 1763; sect. Sebestenoides gen.
 Cordiae DC. Prodr. 9. 467. 1845., Gürke Nat. Pflanzenfam. Borrag. p. 81. 1893.
 Typus generis: Cordia sebestena L.
Cordia angiocarpa A. Rich. in Sagra Hist. Nat. Cub. IX. 1850. p. 110. tab.60.
Cordia boissieri A. DC. in DC. Prodr. 9: 478. 1845.
Cordia brachycalyx Urb. Symb. Ant.
Cordia buchii Urb. Symb. Ant. 1:475. 1900.
Cordia caymanensis Urb. Symb. Ant. 7:344. 1912.
Cordia crispiflora DC. Prodr. 9:476. 1845.
Cordia curbeloi Alain Contr. Ocas. Mus. Hist. Nat. Col. La Salle. 15:9. 1956.
Cordia dodecandra DC. Prodr. 9:478. 1845.
Cordia dumosa Alain Contr. Ocas. Mus. Hist. Nat. 1. c. 59:9. 1956.
Cordia ensifolia Urb. Symb. Ant. 1:476. 1900.
Cordia fitchii Urb. Symb. Ant. 8:576. 1914.
Cordia galeottiana A. Rich. in Sagra Hist. Nat. Cuba IX. 1850. p. 109.
Cordia greggii Torr.
Cordia ignea Urb. et Ekm. Ark. Bot. 22 A No. 17:78. 1928.
Cordia juglandifolia Jacq. Enum. 1760. p. 14.
Cordia leonis (Britt. et Wils.) Ekm. ex Urb. Ark. Bot. 22 A No. 17:77. 1929.
Cordia leucosebestena Griseb. Cat. Plant. Cub. 1866: 208.
Cordia microsebestena Loes. Verh. Bot. Ver. Brand. 55:187. 1913.
Cordia pulverulenta (Urb.) Alain l. c. 15:11. 1956.
Cordia rickseckeri Millsp. Field. Columb. Mus. Bot. 1:522.
Cordia sebestena L. Spec. Pl. I. ed. I. 1753. p. 190.
Cordia subcordata Lam. Illustr. 1889, 1803.
Cordia suckertii Chiovenda, Atti Soc. Nat. Mat. Modena 66:13.
Cordia tortuensis Urb. et Ekm. Erk. Bot. 20 A No.
Cordia triangularis Urb. et Ekm. Ark. Bot. 22 A No. 17:78. 1929.

Varronia P. Browne

Civ. Nat. Hist. Jam. p. 172. tab. 13. f. 2. 1756.; Jacquin Enum. p. 14. 1760.; Desvaux: Varronia J. Bot. 1:257. 1808. non Varronia DC. Prodr. 9:468. 1845.; Varronia Millsp. Praen. Baham. Field. Mus. Bot. 2:311. 1909. Varronia Britton Fl. Virg. Isl. p. 172. 1918. Britton Bull. Torr. Bot. Cl. 50:16. 1914. Britton et Wilson Sci. Surv. Porto Rico and Virg. Isl. New York Acad. 6:122. 1925.; Varronia, Ulmarronia, Varroniopsis et Montjolya Friesen Bull. Soc. Bot. Genève 24:139-143, Cordiopsis Desv. 1808.; Cordiopsis sect. Cordiae DC. Prodr. 9:498. 1845. Sect. Myxa Endl. p.p. sensu DC. 1845 and Gürke Borrag. Nat. Pflanzenfam. 83-84. 1893.; Sect. Varronia Johnst. sub Cordia, Contr. Gray Herb. 92:16. 1930:

Shrubs or small trees with terminal or axillary capitate, spicate or very shortly cymose umbellate to globose inflorescences. Flowers (4)-5-merous, mostly small, calyx lobes thickened at the margin, opening regularly, frequently with \pm long appendage. Corolla tube shorter or as long as the calyx, mostly larger than the corolla lobes, often with a hairy ring in the throat. Fruit small, capsule or berry disrupting the calyx while ripening. Pollen grains spheroidal, 3-porate to pantoporate, sexine semi-tectate, reticulate, heterobrochate with microtubercles on the walls of the reticulum. Pollen loose, easily spread, pollen kitt few or lacking.

Typus generis: Varronia humilis Jacq.

Although the oldest legitimate binomial belonging to this genus is Lantana corymbosa L. (1753), which is cited by BROWNE in his Civil and Natural History of Jamaica, 9. 172. as a synonym of his first species of Varronia, it turns out clearly of his description and figure (t. 13. fig. 2) that his typical species for Varronia is not the Lantana corymbosa of LINNAEUS, but another species described and named later by JACQUIN as Varronia humilis (1760). Even LINNAEUS, when accepted BROWNE's genus Varronia in his Systema Naturae ed. 10. 2:916. 1759, characterized the genus as follows:

VARRONIA. Cal. denticulatis recurvatis. Drupa nucleo 4-loculari

The phrase "Cal. denticulatis recurvatis" refers to the recurved calyx lobes characteristic for Varronia humilis mentioned by BROWNE as having "limbus in quinque lacinias tenuissimas longas reflexas vel intortas divisas" as shown in his figure, as it was explained by STEARN (1971). The selection of the lectotype of the genus must reflect the intention of the original author and therefore I prefer to select Varronia humilis

as typical species of the revalidated genus Varronia, instead of Lantana corymbosa L. or Varronia corymbosa (L.) Desv., which does not correspond completely to the generic description of P. BROWNE.

According to our studies the genus may be divided into four sections:

I. Sectio Varronia

Varronia pro gen. sensu Friesen 1933:139; Sect. Myxa subsect. Dasycephalae HBK. Nov. Gen. Amer. 3:76. 1818. et in DC. Prodr. 9:496. 1845; et in Gürke Nat. Pflanzenfam. Borrag. 84. 1893. Varroniopsis Friesen 1933:142.

Inflorescence capitate or sometimes clavate, calyx lobes with ± long subulate appendage, corolla lobes shorter than the tube, with hairy ring in the throat.

Type: Varronia humilis Jacq.

II. Sectio Ulmarronia (Friesen) Borhidi comb. nova

Basionym: Ulmarronia Friesen Bull. Soc. Bot. Genève 24:143. 1933; — Varroniae spicis globosis HBK; Subsect. Subcapitatae DC. sub sect. Myxa gen. Cordiae in Prodr. 9:493. 1845 et in Gürke Nat. Pflanzenfam. Borrag. 84. 1893.

Inflorescence globose, after flowering sub-corymbose, margin of calyx lobes thickened.

Type: Lantana corymbosa L.

III. Sectio Montjolya (Friesen) Borhidi comb. nova

Basionym: Montjolya Friesen pro gen. Bull. Soc. Bot. Genève 24:142. 1933. — Syn.: Subsect. Spiciformes DC. sub Sect. Myxa gen. Cordiae in Prodr. 9:488. 1845; et in Gürke Nat. Pflanzenfam. Borrag. 84. 1893.

Inflorescence spicate, calyx lobes thickened without a clearly distinguished appendage.

Type: Lantana bullata L.

IV. Sectio Cordiopsis (Desv.) Borhidi comb. nova

Basionym: Cordiopsis Desv. in Hamilton Prodr. Fl. Ind. Occ. p. 23. 1825. pro gen.; — Sect. Cordiopsis (Desv.) A. DC. sub Cordia in DC. Prodr. 9:498. 1945.

Inflorescence short corymbose, calyx lobes with 5 lacinate lobes, corolla hypocrateriform, lobes truncate, obsolete, corrugate in the bud, pollen pantoporate.

Type: Journefortia serrata L.

The genus with about 150-170 species is essentially of neotropical distribution.

The species belonging to this very well marked and limited genus are cited below with a number of the necessary new combinations.

Varronia sect. Varronia

Varronia acunae Moldenke Phytologia 2:143. 1946. — Cuba

— Syn.: Cordia acunae (Mold.) Alain Contr. Ocas. Mus. Hist. Nat. La Salle No. 15:9. 1956.

Varronia anderssonii (Guerke) Borhidi comb. nova — Galapagos

— Cordia anderssonii Guerke Nat. Pflanzenfam. Iv. 3:83. 1893.

— Syn.: Varronia canescens Andersson Vet. Akad. Handl. Stockholm 1853:203, non HBK.

Varronia areolata (Urb.) Friesen Bull. Soc. Bot. Genève Ser. II. 24:156.

1933. — Hispaniola

— Basionym: Cordia areolata Urb. Symb. Ant. 3: 382. 1903.

Varronia asperrima (P. DC) Friesen l. c. 155. Prodr. 9:498. 1845. in

Urban Symb. Ant. 3:360. 1903.

Varronia asterothrix (Killip) Borhidi comb. nova — Venezuela

— Basionym: Cordia asterothrix Killip J. Wash. Acad. Sci. 17:330. 1927.

Varronia axillaris (M. I. Johnst.) Borhidi comb. nova — Brazil

— Basionym: Cordia axillaris M. I. Johnston Contr. Gray Herb. n. s. 92:35. 1930.

Varronia badaeva (Urb. et Ekm.) Borhidi comb. nova — Hispaniola

— Basionym: Cordia badaeva Urb. et Ekm. Ark. Bot. 22 A, 17:85. 1929.

Varronia bahamensis (Urb.) Millsp. Field. Mus. Bot. 2:310. 1909.

— Basionym: Cordia bahamensis Urb. Symb. Ant. 1:392. 1900.

Varronia baracoensis (Urb.) Borhidi comb. nova — Cuba

— Basionym: Cordia baracoensis Urb. Ark. Bot. 22 A 17:82. 1929.

Varronia barahonensis (Urb.) Friesen l. c. 172 — Hispaniola

— Basionym: Cordia barahonensis Urb. Symb. Ant. 7:345. 1912.

Varronia bombardensis (Urb. et Ekm.) Borhidi comb. nova — Hispaniola

— Basionym: Cordia bombardensis Urb. et Ekm. Ark. Bot. 22 A 17:86. 1929.

Varronia bonplandii Desv. Journ. Bot. 1:275. 1808. — Venezuela

— Syn.: Cordia bonplandii Roem. et Schult. 1819.

Varronia braceliniae (I. M. Johnst.) Borhidi comb. nova — Brazil

— Basionym: Cordia braceliniae I. M. Johnston J. Arn. Arb. 16: 177. 1935.

- Varronia bridgesii Friesen — Bolivia
- Varronia bullata L. Syst. X. ed. II. 1759. p. 916. — Jamaica
— Syn.: Montjolya bullata Friesen Bull. Soc. Bot. Genève Sér. II. 24:142. 1933. — Cordia bullata (L.) Roem. et Schult. in Linné Syst. Veg. ed. nov. 4:462. 1819.
- Varronia calcicola (Urb.) Borhidi comb. nova — Hispaniola
— Basionym: Cordia calcicola Urb. Symb. Ant. 3:359. 1903.
- Varronia calocephala (Cham.) Friesen l. c. 149. — Brazil
— Basionym: Cordia calocephala Cham. Linnaea 4:488. 1829.
- Varronia caput-medusae (Taub.) Friesen l. c. 149. — Brazil
— Basionym: Cordia caput-medusae Taub. Bot. Jahrb. 15. Beibl. n. 38:15. 1893.
- Varronia clarendonensis Britton Bull. Torr. Bot. Club 41:16. 1914. — Jamaica
— Syn.: Cordia clarendonensis (Britt.) Stearn Journ. Arn. Arb. 52:631. 1971.
- Varronia claviceps (Urb. et Ekm.) Borhidi comb. nova — Hispaniola
— Basionym: Cordia claviceps Urb. et Ekm. Ark. Bot. 20 A 5:42. 1926.
- Varronia coriacea Moldenke Phytologia 2:144. 1946. — Cuba
— Syn.: Cordia van-hermannii (Mold.) Alain Contr. Ocas. Mus. Hist. Nat. Col. La Salle 15: 12. 1956. non Cordia coriacea Killip 1927. nec Sagot et Benoist 1933.
- Varronia coyucana (I. M. Johnst.) Borhidi comb. nova — Mexico
— Basionym: Cordia coyucana I. M. Johnst. J. Arn. Arb. 29:227. 1948.
- Varronia dasycephala Desv. Journ. Bot. 1:274. 1808. — Mexico, W-Indies, N. of South-America
— Syn.: Cordia dasycephala Kunth in H. et B.
- Varronia duartei (Borhidi et Muñiz) Borhidi comb. nova — Cuba
— Basionym: Cordia duartei Borhidi et Muñiz Acta Bot. Acad. Sci. Hung. 17:24. 1971.
- Varronia fasciata (Leonard et Alain) Borhidi comb. nova — Haiti
— Basionym: Cordia fasciata Leonard et Alain in Alain Brittonia 20:151. 1968.
- Varronia galapagensis (Guerke) Borhidi comb. nova — Galapagos
— Basionym: Cordia galapagensis Guerke Nat. Pflanzenfam. IV. 3:83. 1893.
— Syn.: Varronia scaberrima Anderss. l. c. non Bertero
- Varronia gibberosa (Urb. et Ekm.) Borhidi comb. nova — Hispaniola
— Basionym: Cordia gibberosa Urb. et Ekm. Ark. Bot. 22 A 17:84. 1929.

- Varronia globosa Jacq. Enum. 14. 1760. — Trop. Amer.
— Syn.: Cordia globosa (Jacq.) Kunth Nov. Gen. 376. 1818.
- Varronia globosa Jacq. ssp. humilis (Jacq.) Borhidi stat. novus
— Basionym: Varronia humilis Jacq. Enum. 14. 1760. Sel. Stirp. 41. 1763.
— Syn.: Cordia humilis (Jacq.) G. Don. Den. Syst. 5:1838. Cordia globosa (Jacq.) Kunth var. humilis (Jacq.) I. M. Johnst. J. Arn. Arb. 30:98. 1959. — Cordia globosa ssp. humilis (Jacq.) Borhidi Bot. Közlem. 58/3:176. 1971.
- Varronia grandiflora Desv. — Brazil, Venezuela
— Syn.: Cordia grandiflora (Desv.) HBK.
- Varronia grisebachii (Urb.) Moldenke Phytologia 2:144. 1946.
— Basionym: Cordia grisebachii Urb. Sym. Ant. 5:477. 1905.
- Varronia hookeriana (Guerke) Borhidi comb. nova — Galapagos
— Basionym: Cordia hookeriana Guerke Engl. Nat. Pflanzenfam. IV. 3:83. 1893.
— Syn.: Varronia linearis Anderss. Vet. Akad. Handl. Stockholm 1853:204. 1855. non V. linearis Pav. ex DC. Prodr. 2:493. 1845.
— Cordia linearis Hook. f. non DC.
- Varronia iberica (Urb.) Borhidi comb. nova — Cuba
— Basionym: Cordia iberica Urb. Ark. Bot. 22 A 17:80. 1929.
- Varronia intricata (Wr. in Sauv.) Borhidi comb. nova — Cuba
— Basionym: Cordia intricata Wr. in Sauv. Anal. Acad. Habana 6:1868.
- Varronia jeremiensis (Urb. et Ekm.) Borhidi comb. nova — Hispaniola
— Basionym: Cordia jeremiensis Urb. et Ekm. Ark. Bot. 22 A No. 17:82. 1929.
- Varronia leucocalyx (Fres.) Borhidi comb. nova — Brazil
— Basionym: Cordia leucocalyx Fres. in Mart. Fl. Bras. 8:822. 1857.
- Varronia leucomalla (Taub.) Borhidi comb. nova — Brazil
— Basionym: Cordia leucomalla Taub. Bot. Jahrb. 15. Beibl. n. 38:14. 1893.
- Varronia leucophlyctis (Hook. f.) Anderss. Vet. Akad. Handl. Stockh. 1853:203. 1855. — Galapagos
— Basionym: Cordia leucophlyctis Hook. f. Trans. Linn. Soc. 20:199. 1851.
- Varronia limicola (Brandeg.) Friesen — Mexico
- Varronia Lima Desv. Journ. I. 1808:278. — Caribbean

- Varronia longipedunculata Britt. et Wils. Bull. Torr. Bot. Club 50:47. 1923. — Cuba
— Syn.: *Cordia longipedunculata* (Britt. et Wils.) Urb. Ark. Bot. 22 A 17:80. 1929.
- Varronia lucayana Millsp. Field. Mus. Bot. 2:311. 1909. — Bahamas
— Syn.: *Cordia lucayana* (Millsp.) Macbr. Field. Mus. Bot. 8:129. 1930. *Montjolya lucayana* (Millsp.) Friesen Bull. Soc. Bot. Genève Ser. II. 24:182.
- Varronia macrocephala Desv. — Amer. trop.
— Syn.: *Cordia macrocephala* (Desv.) HBK.
- Varronia microphylla Desv. Journ. Bot. I:275. 1808.
— Syn.: *Cordia microphylla* (Desv.) Roem. et Schult. Syst. IV:463. 1819.
- Varronia mollissima (Killip) Borhidi comb. nova — Peru
— Basionym: *Cordia mollissima* Killip J. Wash. Acad. Sci. 17:330. 1927.
- Varronia nashii (Urb. et Britt.) Borhidi comb. nova — Hispaniola
— *Cordia Nashii* Urb. et Britt. in Urban Symb. Ant. 5:476. 1905.
- Varronia neowidiana (DC.) Borhidi comb. nova — Brazil
— Basionym: *Cordia neowidiana* A. DC. in DC. Prodr. 9:498. 1845.
- Varronia nipensis (Urb. et Ekm.) Borhidi comb. nova — Cuba
— Basionym: *Cordia nipensis* Urb. et Ekm. Ark. Bot. 22 A 17:83. 1929.
- Varronia nivea (Fres.) Borhidi comb. nova — Brazil
— Basionym: *Cordia nivea* Fres. in Mart. Fl. Bras. 8:26. 1857.
- Varronia oaxacana (DC.) Friesen l. c. — Mexico
— Basionym: *Cordia oaxacana* DC. Prodr. 9:497. 1845.
- Varronia passa (I. M. Johnst.) Borhidi comb. nova — Mexico
— Basionym: *Cordia passa* I. M. Johnst. J. Arn. Arb. 29:227. 1948.
- Varronia paucidentata (Fres.) Friesen — Brazil
— Basionym: *Cordia paucidentata* Fres. in Mart. Fl. Bras. 8:25. 1857.
- Varronia pedunculosa (Wr. in Griseb.) Borhidi comb. nova — Cuba
— Basionym: *Cordia pedunculosa* Wr. ex Griseb. Cat. Pl. Cub. 1866:209.
- Varronia perroyana (Urb. et Ekm.) Borhidi comb. nova — Hispaniola
— Basionym: *Cordia perroyana* Urb. et Ekm. Ark. Bot. 22 A 17:84. 1929.
- Varronia picardae (Urb.) Borhidi comb. nova — Hispaniola
— Basionym: *Cordia picardae* Urb. Symb. Ant. 3:360. 1902.
- Varronia podocephala (Torr.) Borhidi comb. nova — Mexico, Texas
— Basionym: *Cordia podocephala* Torr. Bot. Mex. Bound 135.

- Varronia polyphylla (Fres.) Borhidi comb. nova — Brazil
— Basionym: *Cordia polyphylla* Fres. in Mart. Fl. Bras. 8:26. 1857.
- Varronia polyantha (Benth.) Friesen — Ecuador
— Basionym: *Cordia polyantha* Benth. Pl. Hartw. 121. 1839.
- Varronia polycephala Lam. — Lesser Ant., S-America, Porto Rico, Hispaniola
— Syn.: *Varronia corymbosa* Desv. non *Lantana corymbosa* L., nec *Cordia corymbosa* (Desv.) G. Don, — *Cordia polycephala* (Lam.) M., I. Johnst.
- Varronia pringlei (Robins.) Friesen — Mexico
— Basionym: *Cordia pringlei* Robins. Proc. Am. Acad. 26:169. 1891.
- Varronia revoluta (Hook. f.) Borhidi comb. nova — Galapagos
— Basionym: *Cordia revoluta* Hook. f. Trans. Linn. Soc. 20:199. 1851.
- Varronia rupicola (Urb.) Britton — Puerto Rico, Hispaniola
— Basionym: *Cordia rupicola* Urb.
- Varronia rusbyi (Britt.) Borhidi comb. nova — Bolivia
— Basionym: *Cordia rusbyi* Britt. ex Rusby Mem. Torr. Bot. Club 6:83. 1899.
- Varronia sauvallei (Urb.) Borhidi comb. nova — Cuba
— Basionym: *Cordia sauvallei* Urb. Symb. Ant. 5:477. 1908.
- Varronia scouleri (Hook. f.) Borhidi comb. nova — Galapagos
— Basionym: *Cordia scouleri* Hook. f. Trans. Linn. Soc. 20:200. 1851.
- Varronia selleana (Urb.) Friesen — Hispaniola
— Basionym: *Cordia selleana* Urb. Symb. Ant. 7:346. 1912.
- Varronia sessilifolia (Cham.) Borhidi comb. nova — Brazil
— Basionym: *Cordia sessilifolia* Cham. Linnaea 4:488. 1829.
- Varronia setulosa (Alain) Borhidi comb. nova — Cuba
— Basionym: *Cordia setulosa* Alain Contr. Ocas. Mus. Hist. Nat. Col. La Salle 15:11. 1956.
- Varronia stellata (Greenm.) Borhidi comb. nova — Mexico
— Basionym: *Cordia stellata* Greenm. Proc. Amer. Acad. 39:86. 1903.
- Varronia striata (Fres.) Borhidi comb. nova — Brazil
— Basionym: *Cordia striata* Fres. in Mart. Fl. Bras. 8:23. 1857.
- Varronia subtruncata (Rusby) Friesen — Columbia
— Basionym: *Cordia subtruncata* Rusby Pl. S. Amer. 105. 1920.
- Varronia toaensis (Borhidi et Muñiz) Borhidi comb. nova — Cuba
— Basionym: *Cordia toaensis* Borhidi et Muñiz Acta Bot. Acad. Sci. Hung. 17:24. 1971.

- Varronia truncata (Fres.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia truncata* Fres. in Mart. Fl. Bras. 8:25. 1857.
- Varronia urticacea (Standl.) Friesen — Mexico
 — Basionym: *Cordia urticacea* Standl. Contr. U. S. Nat. Herb. 23:222. 1924.
- Varronia utermarkiana (Borhidi) Borhidi comb. nova — Cuba
 — Basionym: *Cordia utermarkiana* Borhidi Acta Bot. Acad. Sci. Hung. 17:25. 1971.
- Varronia villicaulis (Fres.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia villicaulis* Fres. in Mart. Fl. Bras. 8:24. 1857.
- Varronia sect. Ulmarronia
 (Sectio: Subcapitatae)
- Varronia ambigua (Schlecht. et Cham.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia ambigua* Schlecht. et Cham. Linnaea 5:115. 1830.
- Varronia cana (Mart. et Gal.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia cana* Mart. et Gal. Bull. Acad. Brux. 11/2:331. 1844.
- Varronia candolleana Borhidi nom. novum — Brazil
 — Basionym: *Cordia longifolia* A. DC. in DC. Prodr. 2:495. 1845.
 non *Varronia longifolia* Sessé et Moc. 1893.
- Varronia corchorifolia (DC.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia corchorifolia* A. DC. in DC. Prodr. 2:496. 1845.
- Varronia corymbosa (L.) Desv. — Jamaica, C-Amer.
 — Syn.: *Lantana corymbosa* L. Spec. I. ed. II. 1753. p. 628.
 — *Cordia corymbosa* (L.) G. Don Gen. Syst. IV:383. 1838.
 — *Varronia corymbosa* (L.) Desv., — *Cordia linnaei* Stearn
- Varronia crenata Ruiz et Pav. — Peru
- Varronia dichotoma Ruiz et Pav. — Amer. trop.
- Varronia discolor (Cham.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia discolor* Cham. Linnaea 4:482. 1829.
- Varronia erythrocoeca (Wr. ex Griseb.) Moldenke — Cuba
 — Basionym: *Cordia erythrocoeca* Wr. ex Griseb. Cat. Pl. Cub. 1866:208.
- Varronia fasciculata (Urb. et Ekm.) Borhidi comb. nova — Hispaniola
 — Basionym: *Cordia fasciculata* Urb. et Ekm. Ark. Bot. 20 A 5:43. 1926.

- Varronia foliosa (Mart. et Gal.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia foliosa* Mart. et Gal. Bull. Acad. Brux. 11/2:330. 1844.
- Varronia hermanniifolia (Cham.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia hermanniifolia* Cham. Linnaea 4:484. 1829.
- Varronia inermis (Mill.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia inermis* Miller Dict. 1768.
- Varronia lanceolata (HBK.) Borhidi comb. nova — Colombia
 — Basionym: *Cordia lanceolata* HBK. Nov. Gen. et Sp. 3:75. 1818.
- Varronia mariyuitensis (HBK.) Borhidi comb. nova — Colombia
 — Basionym: *Cordia mariyuitensis* HBK. Nov. Gen. et Sp. 3:75. 1818.
- Varronia microcephala (Willd. in Roem. et Schult.) Borhidi comb. nova — C-America — Venezuela
 — Basionym: *Cordia microcephala* Willd. in Roem. et Schult. Syst. Veg. 4:801. 1819.
- Varronia moensis Moldenke Phytologia 2:145. — Cuba
 — Syn.: *Cordia moensis* (Mold.) Alain Contr. Ocas. Mus. Hist. Nat. Col. La Salle No. 15:11. 1956.
- Varronia parviflora (Ortega) Borhidi comb. nova — Mexico
 — Basionym: *Cordia parviflora* Ortega Hort. Matr. 85.
- Varronia patens (HBK.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia patens* HBK. Nov. Gen. et Sp. 3:75. 1818.
- Varronia salvifolia (Juss. ex Poir.) Borhidi comb. nova — Lesser Antilles
 — Basionym: *Cordia salvifolia* Juss. ex Poir. Encycl. 7:46. 1806.
- Varronia sect. Montjolya
- Varronia acuta (Pittier) Borhidi comb. nova — Colombia
 — Basionym: *Cordia acuta* Pittier Contrib. U. S. Nat. Herb. 18:252. 1917.
- Varronia angustifolia West in Willd. Spec. Pl. 1:1081. 1797.
 — Syn.: *Cordia angustifolia* Roem et Schult. Syst. 4:460. 1819. non Roxb. 1814. — *Cordia stenophylla* Alain Contr. Ocas. Mus. Hist. Nat. Col. La Salle No. 15:12. 1956. — *Montjolya angustifolia* (West in Willd.) Friesen in Bull. Soc. Bot. Genève Ser. II. 24:180. 1933.
- Varronia aubletii (DC.) Borhidi comb. nova — Guyana
 — Basionym: *Cordia aubletii* DC. Prodr. 2:490. 1845.

- Varronia bahiensis (DC.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia bahiensis* DC. Prodr. 9:489. 1845.
- Varronia bellonis (Urb.) Borhidi comb. nova — Puerto Rico
 — Basionym: *Cordia bellonis* Urb. Symb. Ant. 1:393. 1900.
- Varronia bifurcata (Roem. et Schult.) Borhidi comb. nova — Colombia
 — Basionym: *Cordia bifurcata* Roem. et Schult. Syst. Veg. 4:466. 1819.
 — Syn.: *Cordia corymbosa* auct. non (L.) G. Don; *C. corymbosa* var. *detensa* I. M. Johnst.
- Varronia boliviana (Gand.) Borhidi comb. nova — Bolivia
 — Basionym: *Cordia boliviana* Gandoger Bull. Soc. Bot. France 65:62. 1918.
- Varronia brevispicata (Mart. et Gal.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia brevispicata* Mart. et Gal. Bull. Acad. Brux. 11/2:331. 1844.
- Varronia brittonii Millsp. Field Col. Mus. Bot. II.311. 1909.
- Varronia brownei (Friesen) Borhidi comb. nova — Jamaica
 — Basionym: *Montjolya brownei* Friesen Bull. Soc. Bot. Genève 931-2. Sér. II. 24:142. 1933.
 — Syn.: *Cordia brownei* (Friesen) I. M. Johnston Journ. Arn. Arb. 31:177. 1950.
- Varronia campestris (Warm) Borhidi comb. nova — Brazil
 — Basionym: *Cordia campestris* Warm Kjoeb. Videntk. Meddel. 12. 1867.
- Varronia canescens (HBK.) Borhidi comb. nova — Colombia
 — Basionym: *Cordia canescens* HBK. Nov. Gen. et Sp. 3:73. 1818.
- Varronia caracasana (DC.) Borhidi comb. nova — Venezuela
 — Basionym: *Cordia caracasana* DC. Prodr. 9:489. 1845.
- Varronia chacoensis (Chodat) Borhidi comb. nova — Paraguay
 — Basionym: *Cordia chacoensis* Chodat Bull. Soc. Bot. Genève sér. 2. 1920. 12:218. (1921)
- Varronia cinerascens (A. DC.) Borhidi comb. nova — W-Indies
 — Basionym: *Cordia cinerascens* A. DC. in DC. Prodr. 9:492. 1845.
 — Syn.: *Cordia cylindrostachya* auct. non Ruiz et Pavón
- Varronia coloradiphila (Gilli) Borhidi comb. nova — Ecuador
 — Basionym: *Cordia coloradiphila* Gilli Feddes Rep. 24:304. 1983.
- Varronia coralicola (Urb.) Borhidi comb. nova — Hispaniola
 — Basionym: *Cordia coralicola* Urb. Ark. Bot. 22 A 17:79. 1929.

- Varronia costaricensis (I. M. Johnst.) Borhidi comb. nova — Costa Rica
 — Basionym: *Cordia costaricensis* I. M. Johnst. J. Arn. Arb. 30:103. 1949.
- Varronia crenulata (DC.) Friesen — Mexico
 — Basionym: *Cordia crenulata* A. DC. in DC. Prodr. 9:492. 1845.
- Varronia cuneiformis (DC.) Borhidi comb. nova — Venezuela
 — Basionym: *Cordia cuneiformis* DC. Prodr. 9:492. 1845.
- Varronia curassavica Jacq.
- Varronia cylindrostachya Ruiz et Pavon Flor. Peru II.23. 1799. — Trop. Amer.
 — Syn.: *Cordia cylindrostachya* (Ruiz et Pav.) Roem. et Schult. Syst. IV:459. 1819. — *Cordia angustifolia* Roem. et Schult. l. c. 460. non Roxb. — *Montjolya cylindrostachya* (R. et P.) Friesen Bull. Soc. Bot. Genève, Ser. II. 24:181. 1933.
- Varronia divaricata (HBK.) Borhidi comb. nova — Lesser Antillas, Venezuela
 — Basionym: *Cordia divaricata* HBK. Nov. Gen. et Sp. 3:74. 1818.
- Varronia ewanii (Killip) Borhidi comb. nova — Colombia
 — Basionym: *Cordia ewanii* Killip
- Varronia exarata (Urb.) Borhidi comb. nova — Hispaniola
 — Basionym: *Cordia exarata* (Urb.) Symb. Ant. 3:358. 1903.
- Varronia ferruginea Lam.
- Varronia floribunda Desv. — Brazil
 — Syn.: *Cordia floribunda* Spreng. Syst. Veg. 1:652. 1825.
- Varronia glandulosa (Fres.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia glandulosa* Fres. in Mart. Fl. Bras. 8:19. 1857.
- Varronia graveolens (HBK.) Borhidi comb. nova — Brazil, Colombia
 — Basionym: *Cordia graveolens* HBK. Nov. Gen. et Sp. 3:374. 1818.
- Varronia guianensis Desv. — Guyana
- Varronia haitiensis (Urb.) Borhidi comb. nova — Hispaniola
 — Basionym: *Cordia haitiensis* Urb. Symb. Ant. 3:357. 1903.
- Varronia hispida (Benth.) Borhidi comb. nova — C-America
 — Basionym: *Cordia hispida* Benth. Bot. Voy. Sulph. 139.
- Varronia holguinensis (Borhidi et Muñiz) Borhidi comb. nova — Cuba
 — Basionym: *Cordia holguinensis* Borhidi et Muñiz Acta Bot. Acad. Sci. Hung. 22:316. 1976.

- Varronia integrifolia Desv. Journ. Bot. I:271. t. 10 — Caribbean
 — Syn.: *Cordia integrifolia* (Desv.) Roem. et Schult. Syst. IV:461. 1819. — *Montjolya integrifolia* (Desv.) Friesen Bull. Soc. Bot. Genève Sér. II. 24:181. 1933.
- Varronia interrupta (DC.) Borhidi comb. nova — Brazil, Venezuela
 — Basionym: *Cordia interrupta* DC. Prodr. 2:491. 1845.
- Varronia jamaicensis (I. M. Johnst.) Borhidi comb. nova — Jamaica
 — Basionym: *Cordia jamaicensis* I. M. Johnst. Journ. Arn. Arb. 31:178. 1950.
- Varronia lanata (HBK.) Borhidi comb. nova — Colombia
 — Basionym: *Cordia lanata* HBK. Nov. Gen. et Sp. 3:72. 1818.
- Varronia laxiflora (HBK.) Borhidi comb. nova — Mexico — Peru
 — Basionym: *Cordia laxiflora*. HBK. Nov. Gen. et Sp. 3:72. 1818.
- Varronia lenis (Alain) Borhidi comb. nova — Cuba
 — Basionym: *Cordia lenis* Alain Contr. Ocas. Mus. Hist. Nat. Col. La Salle 15:10. 1956.
- Varronia leptoclada (Urb. et Britt.) Millsp. Publ. Field. Columb. Must. Bot. II. 310. 1909. — Cuba — Hispaniola — Porto Rico
 — Basionym: *Cordia leptoclada* Urb. et Britt. Smyb. Ant. 5:478. 1905.
 — Syn.: *Cordia angustifolia* Griseb. non Roem. et Schult.
- Varronia linearis Pav. ex DC. — Mexico
 — Syn.: *Cordia linearis* A. DC. in DC. Prodr. 2:493. 1845.
- Varronia macrostachya Jacq. — Columbia
 — Syn.: *Cordia macrostachya* (Jacq.) Roem. et Schult.
- Varronia martinicensis Jacq. — Lesser Antilles
- Varronia mollis West ex DC.
- Varronia multispicata (Chem.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia multispicata* Cham. Linnaea 4:499. 1829.
- Varronia nesophila (I. M. Johnst.) Borhidi comb. nova — Santa Lucia
 — *Cordia nesophila* I. M. Johnst. J. Arn. Arb. 37:289. 1956.
- Varronia oxyphylla (DC.) Borhidi comb. nova — Guyana
 — Basionym: *Cordia oxyphylla* DC. Prodr. 2:492. 1845.
- Varronia paraguariensis (Chod. et Hassl.) Borhidi comb. nova — Paraguay
 — Basionym: *Cordia paraguariensis* Chodat et Hassl. Bull. Herb. Boiss. sér. 2. 5:305. 1905.

- Varronia pauciflora (Rusby) Borhidi comb. nova — Bolivia
 — Basionym: *Cordia pauciflora* Rusby Mem. Torr. Bot. Cl. 6:83. 1896.
- Varronia peruviana (Roem. et Schult.) Borhidi comb. nova — Mexico — Peru
 — Basionym: *Cordia peruviana* Roem. et Schult. Syst. 4:459. 1819.
- Varronia poeppigii (DC.) Borhidi comb. nova — Peru
 — Basionym: *Cordia poeppigii* DC. Prodr. 2:492. 1845.
- Varronia polystachya (HBK.) Borhidi comb. nova — Venezuela
 — Basionym: *Cordia polystachya* HBK. Nov. Gen. et Sp. 3:73. 1818.
- Varronia riparia (HBK.) Borhidi comb. nova — C-America
 — Basionym: *Cordia riparia* HBK. Nov. Gen. et Sp. 3:71. 1818.
- Varronia rosei (Killip) Borhidi comb. nova — Ecuador
 — Basionym: *Cordia rosei* Killip J. Wash. Acad. Sci. 17:330. 1927.
- Varronia salicina (DC.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia salicina* DC. Prodr. 2:492. 1845.
- Varronia schomburgkii (DC.) Borhidi comb. nova — Guiana
 — Basionym: *Cordia schomburgkii* DC. Prodr. 2:490. 1845.
- Varronia shaferi Britton Mem. Torr. Club 16: 95. 1920. — Cuba
 — Syn.: *Cordia shaferi* (Britt.) Alain
- Varronia spinescens (L.) Borhidi comb. nova — Trop. Amer.
 — Basionym: *Cordia spinescens* L. Mant. 2:206. 1771.
 — Syn.: *Varronia ferruginea* Lam. 1791. — *Varronia crenulata* Sessé et Mocino Fl. Mex. 48. 1893.
- Varronia suffruticosa (Borhidi) Borhidi comb. nova — Cuba
 — Basionym: *Cordia suffruticosa* Borhidi Acta Bot. Acad. Sci. Hung. 22:315. 1976.
- Varronia tobagensis (Urb.) Borhidi comb. nova — Tobago
 — Basionym: *Cordia tobagensis* Urb. Feddes Repert. 16:39. 1919.
- Varronia tomentosa Lam. — Guyana
 — Syn.: *Cordia tomentosa* (Lam.) Roem. et Schult.
- Varronia verbenacea (DC.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia verbenacea* DC. Prodr. 2:491. 1845.
- Varronia wagnerorum (Howard) Borhidi comb. nova — Porto Rico
 — Basionym: *Cordia wagnerorum* Howard J. Arn. Arb. 47:137. 966.

Varronia sect. Cordiopsis

Varronia anisodonta (Urb.) Borhidi comb. nova — Hispaniola

— Basionym: Cordia anisodonta Urb. Symb. Ant. 7:348. 1912.

Varronia chabrensis (Urb. et Ekm.) Borhidi comb. nova — Hispaniola

— Basionym: Cordia chabrensis Urb. et Ekm. Ark. Bot. "" A 17:87. 1929.

Varronia dependens (Urb. et Ekm.) Borhidi comb. nova — Hispaniola

— Basionym: Cordia dependens Urb. et Ekm. Ark. Bot. 22 A 17:87 1929.

Varronia fasciculata (Urb. et Ekm.) Borhidi comb. nova — Hispaniola

— Basionym: Cordia fasciculata Urb. et Ekm. Ark. Bot. 20 A 5:43. 1926.

Varronia foliosa (Mart. et Gal.) Borhidi comb. nova — Mexico, Guatemala

— Basionym: Cordia foliosa Mart. et Gal. Bull. Acad. Brux. 11/2:330. 1844.

Varronia lamprophylla (Urb.) Borhidi comb. nova — Hispaniola

— Basionym: Cordia lamprophylla Urb. Symb. Ant. 7:346. 1912.

Varronia oligodonta (Urb.) Borhidi comb. nova — Hispaniola

— Basionym: Cordia oligodonta Urb. Symb. Ant. 7:347. 1912.

Varronia serrata (L.) Borhidi comb. nova — Greater Antilles

— Basionym: Tournefortia serrata L. Spec. Plant. I. ed. I. 1753.p.140.

— Syn.: Varronia bullata L. Spec. II. ed. I. 1762. p. 276.

Varronia mirabilioides Jacq., Cordia mirabilioides (Jacq.) Roem. et Schult.

Gerascanthus P. Browne

Civ. Nat. Hist. Jamaica 170. 10. Mart. 1756; sectio Gerascanthus Cham. in Linnaea 1829: 171; Cerdana Ruiz et Pav. Fl. Peru. Prodr. p. 37. t. 6. 1794; section Rhabdocalyx A. DC. in DC. Prodr. 9:474. 1845; sectio Pilicordia A. DC. in DC. Prodr. 9:474. 1845; sectio Physoclada DC. Prodr. 9:475. 1845; sectio Myxa Endl. Gen. Plant. p. 644. 1840; Varronia DC. Prodr. 9:468. 1845, non P. Browne; Myxa Friesen Bull. Soc. Bot. Genève 24:136. 1933; Collococcus P. Browne l. c. 167. 1756; Calyptrocordia Britt. in Britt. et Millsp. Sci. Surv. Porto Rico 6:122. 1925.

The rest of the species belonging to the widely considered Cordia is a rather varied group. Several attempts have been made to divide it into several genera, as it was suggested by DE CANDOLLE (1845), BRITTON (1925) and FRIESEN (1933). Features for differentiating them, the form and opening

of flower buds, ribbed or unribbed calyx, size and texture of the corolla have been considered. When analyzing the occurrence of these features represented in a larger number of the species, we experience them occurring in several different combinations overlapping over the different taxonomic groups. So these morphological evidences seem to be insufficient for dividing this group into several genera. The great majority of the species show an irregular opening of the calyx, producing a continuous intermediate range between regular opening of Cordia gerascanthus to the calyptriform disruption of the buds in the Cordia alba. Consequently I support a decision not to split further the remained group of Cordia, and unit them under well marked and described early generic name, which is Gerascanthus P. Browne.

The most important common characteristic features of this re-validated genus are the following:

Tropical trees and shrubs with alternate leaves, the flowers are grouped into mostly large loose cymose-corymbose terminal, sometimes axillary inflorescences. Calyx oblong-elliptic, oblanceolate or obovate, sometimes ribbed with strong nerves, mostly smooth. Flower buds mostly rounded, sometimes apiculate, calyx lobes without thickened margin, opening mostly irregularly or with short lobes, they are mostly membraneous or filmy. Flowers medium sized or small, often dichogamous or functionally monosexual, 5-merous, with fertile ovary and sterile stamens and vice versa. Cleistogamy is also a common feature. Stamens with ovate or quadrate anthers. Pistil bifurcate or twice bifurcate. Pollen grains tricolpate, 3-colporate or 3-colporoidate, with short colpi. Sexine tectate provided by mostly acute, spiny, sometimes rounded or rarely mixed processes or protuberances. (Sterile pollen may be microverrucated.) Pollen kitt abundant often hiding the outer structure of the pollen, sticky, maintaining the pollen grains in a pollinium-like sticky conglomeration.

Typus generis: Cordia gerascanthus L. Syst. Nat. ed. 10. 2: 936. 1759.

The genus includes about 160-180 species from tropical America, Asia, Africa and Oceania.

According to the view of Taroda and Gibbs (1986a) we share their consideration about the subgeneric rank of Gerascanthus and Myxa with the slight difference, namely under the genus Gerascanthus separated of Cordia.

1. Subgenus: Gerascanthus

Syn.: Cerdana Ruiz et Pav. Prodr. 37. 1794.; Cordiada Vellozo, Fl. Flum. 98. 1829; Icones 2: 156. 1831.; Cordia subgen. Gerascanthus Cham., Linnaea 5: 115. 1831.; Cordia sect. Cerdanae

(Ruiz et Pav.) Roem. et Schult., Syst. 4:499. 1818.

2. Subgenus: Myxa (Taroda) Borhidi comb. nova

Basionym: Myxa Taroda pro gubgen. Cordia in Taroda et Gibbs Rev. Bras. Bot. 9: 38. 1986.

Typus subgeneris: Cordia myxa L. Sp. Pl. 1: 190. 1753.

Syn.: Collococcus P. Browne l.c. 167. 1756.; Calyptracordia Britton in Britt. et Wils., Sci. Surv. Porto Rico and Virgin Islands, New York. Acad. Sci. 6: 122. 1925.

It is to be admitted, that the traditional sections do not reflect completely the real variability of this genus. First of all, the relations between the sections Pilicordia and Myxa are not clear. About this point further studies are needed.

As for the nomenclatural consequences of the above treatment the following new combinations are suggested:

Gerascanthus africanus (Lam.) Borhidi comb. nova - Afr. Trop.

- Basionym: Cordia africana Lam., Encycl. Méth. Bot. 1792: 420.

Gerascanthus alliodoros (Ruiz et Pav.) Borhidi comb. nova - Trop. Amer.

- Basionym: Cerdana alliodora Ruiz et Pav. Flor. Peruv. II.47. t. 184. 1799.

- Syn.: Cordia alliodora (Ruiz et Pav.) Cham. in Linnaea VIII. 121. 1833. - Cordia gerascanthus Jacq. Sel. Stirp. Amer. 43. 1763.

Gerascanthus aristeguietae (Agostini) Borhidi comb. nova - Venezuela

- Basionym: Cordia aristeguietae Agostini Phytologia 39(6):433. 1978.

Gerascanthus asterophorus (Mart.) Borhidi comb. nova - Brazil

- Basionym: Cordia asterophora Mart. ex Fresen in Mart. Fl. Bras. 8:5. 1857.

Gerascanthus atro-fuscus (Taub.) Borhidi comb. nova - Brazil

- Basionym: Cordia atro-fusca Taub. Bot. Jahrb. 15. Beibl. no. 38:12. 1893.

Gerascanthus chamissonianus (Steud.) Borhidi comb. nova - Brazil

- Basionym: Cordia chamissoniana Steud. Nom. ed. II. 1:417.

Gerascanthus colimensis (I. M. Johnst.) Borhidi comb. nova - Mexico

- Basionym: Cordia colimensis I. M. Johnst. J. Arn. Arb. 31:186. 1950.

Gerascanthus cujabensis (Manso et Lhotzky) Borhidi comb. nova - Brazil

- Basionym: Cordia cujabensis Manso et Lhotzky ex Cham. Linnaea 8:12. 1833.

Gerascanthus elaeagnoides (A. DC.) Borhidi comb. nova - Mexico

- Basionym: Cordia elaeagnoides A. DC. in DC. Prodr. 9:474. 1845.

Gerascanthus excelsus (A. DC.) Borhidi comb. nova - Brazil

- Basionym: Cordia excelsa A. DC. in DC. Prodr. 9:473. 1845.

Gerascanthus fawcettii (Kr. et Urb.) Borhidi comb. nova - Jamaica

- Basionym: Cordia fawcettii Kr. et Urb. Symb. Ant. 1:391. 1900.

Gerascanthus gerascanthoides (HBK.) Borhidi comb. nova - Trop. Amer.

- Basionym: Cordia gerascanthoides HBK. Kunth. in H. et B. Nov. Gen. III: 83. 1818.

- Syn: Cordia gerascanthus L. Syst. Nat. ed. 10. 2:936. 1759.

Gerascanthus glabratus (A. DC.) Borhidi comb. nova - Brazil

- Basionym: Cordia glabrata A. DC. in DC. Prodr. 9:473. 1845.

Gerascanthus globuliferus (I. M. Johnst.) Borhidi comb. nova - Mexico

- Basionym: Cordia globulifera I. M. Johnst. J. Arn. Arb. 31:184. 1950.

Gerascanthus goeldianus (Huber) Borhidi comb. nova - Brazil

- Basionym: Cordia goeldiana Huber Mus. Bot. Para. 6:89. 1910.

Gerascanthus gracilipes (I. M. Johnst.) Borhidi comb. nova - Mexico

- Basionym: Cordia gracilipes I. M. Johnst. J. Arn. Arb. 31:186. 1950.

Gerascanthus guerkeanus (Loes.) Borhidi comb. nova - Mexico

- Basionym: Cordia guerkeana Loes. Verh. Bot. Ver. Brandenbg. 55:186. 1913.

Gerascanthus haenkeanus (Mez) Borhidi comb. nova - Peru

- Basionym: Cordia haenkeana Mez Bot. Jahrb. 12:560. 1890.

Gerascanthus harrisii (Urb.) Borhidi comb. nova - Jamaica

- Basionym: Cordia harrisii Urb. Symb. Ant. 5:474. 1904.

Gerascanthus hypoleucus (A. DC.) Borhidi comb. nova - Brazil

- Basionym: Cordia hypoleuca A. DC. in DC. Prodr. 9:472. 1845.

Gerascanthus iguaguanus (I. M. Johnst.) Borhidi comb. nova - Peru

- Basionym: Cordia iguaguana I. M. Johnst. J. Arn. Arb. 33:63. 1952.

Gerascanthus igualensis (Bartlett) Borhidi comb. nova - Mexico

- Basionym: Cordia igualensis Bartlett Contr. Gray Herb. 36:632. 1909.

Gerascanthus insignis (Cham.) Borhidi comb. nova - Brazil

- Basionym: Cordia insignis Cham. Linnaea 8:122. 1833.

Gerascanthus longipedus (Mez) Borhidi comb. nova - Brazil

- Basionym: Cordia longipeda Mez Bot. Jahrb. 12:550. 1890.

- Gerascanthus luteus (Lam.) Borhidi comb. nova — Galapagos
 — Basionym: *Cordia lutea* Lam. Tabl. Encycl. 1:421. 1791.
- Gerascanthus megalanthus (Blake) Borhidi comb. nova — Guatemala
 — Basionym: *Cordia megalantha* Blake Proc. Biol. Soc. Wash. 36:200. 1923. — *Cordia macrantha* Blake not Chodat
- Gerascanthus morelosanus (Standl.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia morelosana* Standl. Contr. US. Nat. Herb. 23:1220. 1927.
- Gerascanthus nelsonii (I. M. Johnst.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia nelsonii* I. M. Johnst. J. Arn. Arb. 31:183. 1950.
- Gerascanthus nettoanus (Taub.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia nettoana* Taub. Bot. Jahrb. 15. Beibl. no. 38:11. 1893.
- Gerascanthus petenensis (Lundell) Borhidi comb. nova — Guatemala
 — Basionym: *Cordia petenensis* Lundell Wrightia 4:49. 1968.
- Gerascanthus rufescens (A. DC.) Borhidi comb. nova — S. America
 — Basionym: *Cordia rufescens* A. DC. in DC. Prodr. 9:476. 1845.
- Gerascanthus sonorae (Rose) Borhidi comb. nova — Mexico
 — Basionym: *Cordia sonorae* Rose Contr. US. Nat. Herb. 1:106. t. 9. 1891.
- Gerascanthus tinifolius (Willd. ex Roem. et Schult.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia tinifolia* Willd. ex Roem. et Schult. Syst. 4:801. 1819.
- Gerascanthus trichotomus (Vell.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia trichotoma* Vell. ex Steud. Nom. ed. 2. 1:419.
- Gerascanthus troyanus (Urb.) Borhidi comb. nova — Jamaica
 — Basionym: *Cordia troyana* Urb. Symb. Ant. 5:475. 1904.
- Gerascanthus varroniifolius (I. M. Johnst.) Borhidi comb. nova — Peru
 — Basionym: *Cordia varroniifolia* M. I. Johnst. J. Arn. Arb. 33:62. 1952.

Subgenus: Myxa (Taroda) Borhidi

Neotropical species:

- Gerascanthus acutifolius (Fres.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia acutifolia* Fres. in Mart. Fl. Bras. 8:11. 1857.

- Gerascanthus anabaptista (Cham.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia anabaptista* Cham. Linnaea 8:512. 1833.
- Gerascanthus bicolor (A. DC.) Borhidi comb. nova — Centr. Amer.
 — Basionym: *Cordia bicolor* A. DC. Prodr. 9:485. 1845.
- Gerascanthus bifurcatus (Roem. et Schult.) Borhidi comb. nova — W-Indies
 — Basionym: *Cordia bifurcata* Roem. et Schult. in I. Syst. Veg. ed. nov. 4:466. 1819.
- Gerascanthus bogotensis (Benth.) Borhidi comb. nova — Colombia
 — Basionym: *Cordia bogotensis* Benth. Pl. Hartw. 240. 1845.
- Gerascanthus borinquensis (Urb.) Borhidi comb. nova — Porto Rico
 — Basionym: *Cordia borinquensis* Urb. Symb. Ant. 1:390. 1900.
- Gerascanthus brachypodus (DC.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia brachypoda* DC. Prodr. 9:487. 1845.
- Gerascanthus calophyllus (Vahl) Borhidi comb. nova — Guyana
 — Basionym: *Cordia calophylla* Vahl Eclog. Amer. 315. 1807.
- Gerascanthus collococcus (L.) Borhidi comb. nova — Caribbean
 — Basionym: *Cordia collococca* L. Fl. Jam. 14. 1759.
- Gerascanthus colombianus (Killip) Borhidi comb. nova — Colombia
 — Basionym: *Cordia colombiana* Killip J. Wash. Acad. Sci. 17:327. 1927.
- Gerascanthus cordifolius (HBK.) Borhidi comb. nova — Colombia
 — Basionym: *Cordia cordifolia* HBK. Nov. Gen. et Spec. 3:70. 1818.
- Gerascanthus cordiformis (Johnst.) Borhidi comb. nova — Guatemala
 — Basionym: *Cordia cordiformis* Johnst. J. Arn. Arb. 18:10. 1937.
- Gerascanthus cymosus (Donn.-Sm.) Borhidi comb. nova — Costa Rica — Panama
 — Basionym: *Cornutia cymosa* Donn.-Sm. Bot. Gaz. 40:10. 1905.
- Gerascanthus decipiens (I. M. Johnst.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia decipiens* I. M. Johnston J. Arn. Arb. 18:11. 1937.
- Gerascanthus diversifolius (Pav. ex DC.) Borhidi comb. nova — C-America
 — Basionym: *Cordia diversifolia* Pav. ex DC. Prodr. 9:474. 1845.
- Gerascanthus dwyeri (Nowicke) Borhidi comb. nova — C-America
 — Basionym: *Cordia dwyeri* Nowicke Phytologia 18:419. 1969.
- Gerascanthus ecalyculatus (Vell.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia ecalyculata* Vell. Fl. Flum. 96. 2. t. 140.
- Gerascanthus ellipticus (Sw.) Borhidi comb. nova — W-Indies
 — Basionym: *Cordia elliptica* Sw. Nov. Gen. et Spec. Pl. 47. 1788.
- Gerascanthus exaltatus (Lam.) Borhidi comb. nova — Guyana
 — Basionym: *Cordia exaltata* Lam. Illustr. 1. n. 1919. 1791.

- Gerascanthus eriostigma (Pittier) Borhidi comb. nova - Costa Rica
- Basionym: *Cordia eriostigma* Pittier Contr. US. Nat. Herb. 18:251. fig. 101. 1917.
- Gerascanthus flavescens (Aubl.) Borhidi comb. nova - Guyana
- Basionym: *Cordia flavescens* Aubl. Pl. Guian. 1:226. t. 89. 1775.
- Gerascanthus grandifolius (A. DC.) Borhidi comb. nova - Brazil
- Basionym: *Cordia grandifolia* A. DC. in -DC. Prodr. 2:475. 1845.
- Gerascanthus hebecladus (I. M. Johnst.) Borhidi comb. nova - S-America
- Basionym: *Cordia hebeclada* I. M. Johnst. J. Arn. Arb. 31:176. 1950.
- Gerascanthus heterophyllus (Roem et Schult.) Borhidi comb. nova - Guyana
- Basionym: *Cordia heterophylla* Roem et Schult. Syst. 4:800. 1819.
- Gerascanthus hintoni (I. M. Johnst.) Borhidi comb. nova - Mexico
- Basionym: *Cordia hintoni* I. M. Johnst. J. Arn. Arb. 21:343. 1940.
- Gerascanthus hirtus (I. M. Johnst.) Borhidi comb. nova - Venezuela
- Basionym: *Cordia hirta* I. M. Johnst. J. Arn. Arb. 16:29. 1935.
- Gerascanthus inornatus (I. M. Johnst.) Borhidi comb. nova - Mexico
- Basionym: *Cordia inornata* I. M. Johnst. J. Arn. Arb. 21:341. 1940.
- Gerascanthus laevigatus (Lam.) Borhidi comb. nova - W-Indies
- Basionym: *Cordia laevigata* Lam. Tabl. Encycl. et Méth. Bot. 1:422. 1792.
- Gerascanthus lasiocalyx (Pittier) Borhidi comb. nova - Panama
- Basionym: *Cordia lasiocalyx* Pittier Contr. US. Nat. Herb. 18:251. 1917.
- Gerascanthus latifolius (Cham.) Borhidi comb. nova - Brazil
- Basionym: *Cordia latifolia* Cham. Linnaea 8:126. 1833.
- Gerascanthus lomato lobus (I. M. Johnst.) Borhidi comb. nova - Brazil
- *Cordia lomato lobus* I. M. Johnston J. Arn. Arb. 18:12. 1937.
- Gerascanthus lucidulus (I. M. Johnst.) Borhidi comb. nova - C-America
- Basionym: *Cordia lucidula* I. M. Johnst. J. Arn. Arb. 21:352.
- Gerascanthus macrophyllus (L.) Borhidi comb. nova - W-Indies
- Basionym: *Cordia macrophylla* L. Spec. Pl. ed. 2. I:274. 1762.
- Gerascanthus magnoliifolius (Cham.) Borhidi comb. nova - Brazil
- Basionym: *Cordia magnoliifolia* Cham. Linnaea 4:476. 1829.
- Gerascanthus membranaceus (A. DC.) Borhidi comb. nova - Ecuador
- Basionym: *Cordia membranacea* A. DC. in DC. Prodr. 2:484. 1845.
- Gerascanthus mexianus (I. M. Johnst.) Borhidi comb. nova - Brazil
- Basionym: *Cordia mexiana* I. M. Johnston J. Arn. Arb. 18:12-13. 1937.

- Gerascanthus muneco (HBK.) Borhidi comb. nova - Colombia
- Basionym: *Cordia muneco* HBK. Nov. Gen. et Sp. 7:207. 1823.
- Gerascanthus naidophilus (I. M. Johnst.) Borhidi comb. nova - S-America
- Basionym: *Cordia naidophila* I. M. Johnst. J. Arn. Arb. 16:32. 1935.
- Gerascanthus obscurus (Cham.) Borhidi comb. nova - Brazil
- Basionym: *Cordia obscura* Cham. Linnaea 13:480. 1839.
- Gerascanthus ochraceus (DC.) Borhidi comb. nova - Brazil
- Basionym: *Cordia ochracea* DC. Prodr. 2:477. 1845.
- Gerascanthus opacus (Rusby) Borhidi comb. nova - S. America
- Basionym: *Cordia opaca* Rusby Descr. New. Sp. S. Amer. Pl. 104. 1920.
- Gerascanthus panamensis (Riley) Borhidi comb. nova - Panama
- Basionym: *Cordia panamensis* Riley Kew Bull. 1927:125. 1927.
- Gerascanthus panicularis (Rudge) Borhidi comb. nova - S. America
- Basionym: *Cordia panicularis* Rudge Pl. Guian. 30. t. 46.
- Gerascanthus parvifolius (A. DC.) Borhidi comb. nova - Mexico
- Basionym: *Cordia parvifolia* A. DC. Prodr. 2:498. 1845.
- Gerascanthus protractus (I. M. Johnst.) Borhidi comb. nova - Panama
- Basionym: *Cordia protracta* I. M. Johnst. J. Arn. Arb. 21:349. 1940.
- Gerascanthus prunifolius (I. M. Johnst.) Borhidi comb. nova - Guatemala
- Basionym: *Cordia prunifolia* I. M. Johnst. J. Arn. Arb. 21:353. 1940.
- Gerascanthus pubescens (Willd.) Borhidi comb. nova - Brazil
- Basionym: *Cordia pubescens* Willd. ex Roem. et Schult. Syst. 4:800. 1819.
- Gerascanthus reticulatus (Vahl) Borhidi comb. nova - Caribbean
- Basionym: *Cordia reticulata* Vahl Eclog. 3:5 1807.
- Gerascanthus ripicola (I. M. Johnst.) Borhidi comb. nova - Peru
- Basionym: *Cordia ripicola* I. M. Johnston J. Arn. Arb. 16:180. 1935.
- Gerascanthus rotatus (Moc.) Borhidi comb. nova - Mexico
- Basionym: *Cordia rotata* Moc. ex DC. Prodr. 2:483. 1845.
- Gerascanthus salicifolius (Cham.) Borhidi comb. nova - Brazil
- Basionym: *Cordia salicifolia* Cham. Linnaea 4:481. 1829.
- Gerascanthus sagotii (I. M. Johnst.) Borhidi comb. nova - Surinam
- Basionym: *Cordia sagotii* I. M. Johnst. J. Arn. Arb. 16:27. 1935.
- Gerascanthus salvadorensis (Standl.) Borhidi comb. nova - Honduras
- Basionym: *Cordia salvadorensis* Standl. J. Wash. Acad. Sci. 14:242. 1924.

- Gerascanthus scaberrimus (HBK.) Borhidi comb. nova — Peru
 — Basionym: *Cordia scaberrima* HBK. Nov. Gen. et Sp. 3:71. 1818.
- Gerascanthus scabridus (Mart.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia scabrida* Mart. ex Fres. in Mart. Fl. Bras. 8:11. 1857.
- Gerascanthus scabrifolius (A. DC.) Borhidi comb. nova — Guyana
 — Basionym: *Cordia scabrifolia* A. DC. in DC. Prodr. 2:485. 1845.
- Gerascanthus sellowianus (Cham.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia sellowiana* Cham. Linnaea 4:479. 1829.
- Gerascanthus sericalyx (A. DC.) Borhidi comb. nova — Guyana
 — Basionym: *Cordia sericalyx* A. DC. in DC. Prodr. 2:485. 1845.
- Gerascanthus skutchii (I. M. Johnst.) Borhidi comb. nova — Guatemala
 — Basionym: *Cordia skutchii* I. M. Johnst. J. Arn. Arb. 21:339. 1940.
- Gerascanthus sprucei (Mez) Borhidi comb. nova — Brazil
 — Basionym: *Cordia sprucei* Mez Bot. Jahrb. 12:549. 1890.
- Gerascanthus stelliferus (I. M. Johnst.) Borhidi comb. nova — C-America
 — Basionym: *Cordia stellifera* I. M. Johnst. J. Arn. Arb. 21:350. 1940.
- Gerascanthus stenocladus (I. M. Johnst.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia stenoclada* I. M. Johnst. J. Arn. Arb. 21:353. 1940.
- Gerascanthus subvelutinus (I. M. Johnst.) Borhidi comb. nova — Mexico
 — Basionym: *Cordia subvelutina* I. M. Johnst. J. Arn. Arb. 21:344. 1940.
- Gerascanthus sulcatus (DC.) Borhidi comb. nova — W-Indies
 — Basionym: *Cordia sulcata* DC. Prodr. 2:488. 1845.
- Gerascanthus superbus (Cham.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia superba* Cham. in Linnaea 4:474. 1829.
- Gerascanthus taguahuyensis (Vell.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia taguahuyensis* Vell. Fl. Flum. 98. 2. t. 154.
- Gerascanthus tetrandrus (Aubl.) Borhidi comb. nova — Guyana, Brazil
 — Basionym: *Cordia tetrandra* Aubl. Pl. Guian. 1:222. t. 87. 1775.
- Gerascanthus tetraphyllus (Aubl.) Borhidi comb. nova — Guyana
 — Basionym: *Cordia tetraphylla* Aubl. Pl. Guian. 1:224. t. 88. 1775.
- Gerascanthus toqueve (Aubl.) Borhidi comb. nova — Guyana
 — Basionym: *Cordia toqueve* Aubl. Pl. Guian. 1:228. t. 90. 1775.
- Gerascanthus trachyphyllus (Mart.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia trachyphylla* Mart. Herb. Fl. Bras. n. 412. 1841.

- Gerascanthus trichocladus (A. DC.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia trichoclada* A. DC. in DC. Prodr. 2:475. 1845.
- Gerascanthus ucayaliensis (I. M. Johnst.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia ucayaliensis* I. M. Johnst. J. Arn. Arb. 16:181. 1935.
- Gerascanthus ulei (I. M. Johnst.) Borhidi comb. nova — Brazil
 — Basionym: *Cordia ulei* I. M. Johnston Contr. Gray Herb. n. s. 92:56. 1930.
- Gerascanthus valenzuelanus (A. Rich.) Borhidi comb. nova — Cuba
 — Basionym: *Cordia valenzuelana* A. Rich. in Sagra Hist. Nat. Cuba XI. 15. 1850.
- Gerascanthus viridis (Rusby) Borhidi comb. nova — Venezuela
 — Basionym: *Bourreria viridis* Rusby Descr. 300 So. Amer. Pl. 100. 1920.
- Palaeotropical and Pantropical species:
- Gerascanthus albus (Jacq.) Borhidi comb. nova
 — Basionym: *Varronia alba* Jacq. Enum. Plant. Carib. 14. 1760; Select. Stirp. Amer. 41. 1763.
 — Syn.: *Cordia alba* (Jacq.) Roem. et Schult. Syst. 4:466. 1819. —
- Gerascanthus aurantiacus (Baker) Borhidi comb. nova — Afr. trop.
 — Basionym: *Cordia aurantiaca* Baker Kew Bull. 1894:26.
- Gerascanthus bakeri (Britten) Borhidi comb. nova — Afr. trop.
 — Basionym: *Cordia bakeri* Britten Journ. Bot. 1895:88.
- Gerascanthus balanocarpus (Brenan) Borhidi comb. nova — Tanzania
 — Basionym: *Cordia balanocarpa* Brenan Kew Bull. 1949:91.
- Gerascanthus batesii (Wernh.) Borhidi comb. nova — Cameroon
 — Basionym: *Cordia batesii* Wernh. Journ. Bot. 54:229. 1916.
- Gerascanthus bequaertii (DeWild) Borhidi comb. nova — Congo Belg.
 — Basionym: *Cordia bequaertii* DeWild Rev. Zool. Afr. 9. Suppl. Bot. 88. 1921.
- Gerascanthus caffra (Sond.) Borhidi comb. nova — S. Africa
 — Basionym: *Cordia caffra* Sond. in Linnaea 23:81. 1850.
- Gerascanthus chaetodonta (Melchior) Borhidi comb. nova — Tanzania
 — Basionym: *Cordia chaetodonta* Melchior Notizbl. Bot. Gart. Berlin 11:676. 1932.

- Gerascanthus cochinchinensis (Gagnep.) Borhidi comb. nova - SE-Asia
- Basionym: *Cordia cochinchinensis* Gagnep. Not. Syst. 3:35. 1914.
- Gerascanthus crenatus (Del.) Borhidi comb. nova - Egypt.
- Basionym: *Cordia crenata* Delile Fl. Egypt. 195. t. 20. 1813.
- Gerascanthus cumingianus (Vid.) Borhidi comb. nova - Philippines
- Basionym: *Cordia cumingiana* Vidal Phan. Cuming. Philipp. 187.
- Gerascanthus dichotomus (Forster f.) Borhidi comb. nova - SE-Asia, New Caledonia NE-Australia
- Basionym: *Cordia dichotoma* Forster f. Prodr. 18. 1786.
- Gerascanthus diffusus (Jacob) Borhidi comb. nova - India
- Basionym: *Cordia diffusa* Jacob Journ. Bombay Nat. Hist. Soc. 45:78. 1944.
- Gerascanthus dioicus (Boj. ex DC.) Borhidi comb. nova - E-Africa, Malaga
- Basionym: *Cordia dioica* Boj. ex DC. Prodr. 2:481. 1845.
- Gerascanthus ehretioides (Good.) Borhidi comb. nova - Afr. trop.
- Basionym: *Cordia ehretioides* Good. Journ. Bot. 47. Suppl. 2:107. 1929.
- Gerascanthus faulknerae (B. Verdc.) Borhidi comb. nova - Tanzania
- Basionym: *Cordia faulknerae* B. Verdc. Bol. Soc. Brot. 53:104. 1980.
- Gerascanthus fissistylus (K. Volles.) Borhidi comb. nova - Tanzania
- Basionym: *Cordia fissistyla* K. Vollesen Nord. J. Bot. 1(3):325. 1981.
- Gerascanthus fragrantissimus (Kurz) Borhidi comb. nova - India
- Basionym: *Cordia fragrantissima* Kurz Prel. Rep. For. Veg. Peg. App. A. 92. 1875.
- Gerascanthus fulvosus (Wight) Borhidi comb. nova - India
- Basionym: *Cordia fulvosa* Wight Icon. 4. t. 1380.
- Gerascanthus furcans (I. M. Johnst.) Borhidi comb. nova - SE-Asia
- Basionym: *Cordia furcans* I. M. Johnst. J. Arn. Arb. 32:5. 1951.
- Gerascanthus gharaf (Ehrenb. ex Aschers.) Borhidi comb. nova - E-Africa, S-Asia
- Basionym: *Cordia gharaf* Ehrenb. ex Aschers. Sitzb. Naturf. Fr. Beil. 46. 1879.
- Gerascanthus gillettii (Wildem) Borhidi comb. nova - Congo
- Basionym: *Cordia gillettii* Wildem Ann. Mus. Congo sér. 5. 1:71.
- Gerascanthus glaziovii (Mez) Borhidi comb. nova - Brazil

- Basionym: *Patagonula glaziovii* Mez Bot. Jahrb. 12. Beibl. no. 27:17. 1890.
- Syn.: *Cordia glaziovii* (Mez) Taub.
- Gerascanthus goetzei (Guerke) Borhidi comb. nova - Afr. trop.
- Basionym: *Cordia goetzei* Guerke Engl. Bot. Jahrb. 28:307.
- Gerascanthus goossensii (DeWild) Borhidi comb. nova - Congo Belg.
- Basionym: *Cordia goossensii* DeWild Miss. de Briey Mayumbe 214. 1920.
- Gerascanthus grandis (Roxb.) Borhidi comb. nova - India
- Basionym: *Cordia grandis* Roxb. Hort. Beng. 17. Fl. Ind. 1:593.
- Gerascanthus griffithii (C. B. Clarke) Borhidi comb. nova - Malacca Pen. Thailand
- Basionym: *Cordia griffithii* C. B. Clarke In Hook. f. Fl. Brit. Ind. 4:139.
- Gerascanthus guineensis (Thonn.) Borhidi comb. nova - Guinea
- Basionym: *Cordia guineensis* Thonn. in Schum. Beskr. Guin. Pl. 128.
- Gerascanthus heudelotii (Baker) Borhidi comb. nova - Afr. occ.
- Basionym: *Cordia heudelotii* Baker Kew Bull. 1894:27.
- Gerascanthus johnsonii (Baker) Borhidi comb. nova - Afr. trop.
- Basionym: *Cordia johnsonii* Baker in Dyer Fl. Trop. Afr. 4:11. 1913.
- Gerascanthus kanehirai (Hayata) Borhidi comb. nova - Taiwan
- Basionym: *Cordia kanehirai* Hayata Icon. Pl. Formosa 6:31. 1916.
- Gerascanthus kirkii (Baker) Borhidi comb. nova - Zambesia
- Basionym: *Cordia kirkii* Baker Kew Bull. 1894:28.
- Gerascanthus macleodii (Hook. f. ex Thonn.) Borhidi comb. nova - India
- Basionym: *Cordia macleodii* Hook. f. et Thoms. J. Linn. Soc. 2:128. 1858.
- Gerascanthus mairei (Humbert) Borhidi comb. nova - Afr. trop.
- Basionym: *Cordia mairei* Humbert Mem. Soc. Hist. Nat. Afr. Nordhors-sér. 2:173. 1949.
- Gerascanthus mhaya (Kerr) Borhidi comb. nova - Burma, Siam
- Basionym: *Cordia mhaya* Kerr Kew Bull. 1940:184.
- Gerascanthus micronesicus (Kanehira et Hatusima) Borhidi comb. nova - Ins. Pulau
- Basionym: *Cordia micronesica* Kanehira et Hatusima Bot. Mag. Tokyo 53:157. 1940.
- Gerascanthus millenii (Baker) Borhidi comb. nova - E. Afr. - S. Asia
- Basionym: *Cordia millenii* Baker Kew Bull. 1894:27.

- Gerascanthus moluccanus (Roxb.) Borhidi comb. nova - SE-Asia
- Basionym: *Cordia moluccana* Roxb. Hort. Beng. 84., Fl. Ind. 2:594.
- Gerascanthus molundensis (Mildbr.) Borhidi comb. nova - Cameroon
- Basionym: *Cordia molundensis* Mildbr. in Wiss. Ergebn. Deutsch. Zentr. Afr. Exped. 1910-11. 2:34. 1922.
- Gerascanthus monoicus (Roxb.) Borhidi comb. nova - India
- Basionym: *Cordia monoica* Roxb. Pl. Corom. 1:43, t. 58.
- Gerascanthus mukuensis (Taton) Borhidi comb. nova - Zaire
- Basionym: *Cordia mukuensis* Taton Bull. Jard. Bot. Nat. Belg. 41(2):258. 1971.
- Gerascanthus myxus (L.) Borhidi comb. nova - Palearctica, Africa, Asia, Australia
- Basionym: *Cordia myxa* L. Sp. Pl. 190. 1753.
- Syn.: *Cordia obliqua* Willd.; *C. domestica* Roth ex Roem. et Schult.
- Gerascanthus nevillei (Alston) Borhidi comb. nova - Trop. Afr.-Asia
- Basionym: *Cordia nevillei* Alston in Trimen Handb. Fl. Ceyl. Suppl. 1931: 199.
- Gerascanthus oblongifolius (Thwait.) Borhidi comb. nova - Ceylon
- Basionym: *Cordia oblongifolia* Thwait. Enum. Pl. Zeyl. 214.
- Gerascanthus obovatus (Balf. f.) Borhidi comb. nova - Socotra
- Basionym: *Cordia obovata* Balf. f. Proc. Roy. Soc. Edinb. 12:80. 1884.
- Gerascanthus obtusus (Balf. f.) Borhidi comb. nova - Socotra
- Basionym: *Cordia obtusa* Balf. f., Diagn. Pl. Nov. Phan. Socot. 1883: 80.
- Gerascanthus perbellus (Mildbr.) Borhidi comb. nova - Cameroon
- Basionym: *Cordia perbella* Mildbr. Feddes Rep. 18:98. 1922.
- Gerascanthus pilosissimus (Baker) Borhidi comb. nova - Angola
- Basionym: *Cordia pilosissima* Baker Kew Bull. 1894:28.
- Gerascanthus populifolius (Baker) Borhidi comb. nova - Afr. occ.
- Basionym: *Cordia populifolia* Baker Kew Bull. 1894:27.
- Gerascanthus roxburghii (C. B. Clarke) Borhidi comb. nova - Ceylon
- Basionym: *Cordia roxburghii* C. B. Clarke in Hook. f. Fl. Brit. Ind. 4:139.
- Gerascanthus sinensis (Lam.) Borhidi comb. nova - Trop. Afr. - Asia
- Basionym: *Cordia sinensis* Lam. Encycl. Méth. Bot. 1792: 423.
Syn.: *Cordia gharaf* Ehrenb. ex Aschers.; *C. subopposita* DC.; *C. reticulata* Roth ex Roem. et Schult.; *C. angustifolia* Roxb.;

- C. senegalensis* Juss.; *C. quercifolia* Klotsch, *C. ovalis* R. Br.
- Gerascanthus somaliensis (Baker) Borhidi comb. nova - E. Afr.
- Basionym: *Cordia somaliensis* Baker Bull. Misc. Inf. Kew Bull. 1894: 28.
- Gerascanthus suaveolens (Blume) Borhidi comb. nova - Java
- Basionym: *Cordia suaveolens* Blume Bijdr. 843.
- Gerascanthus subpubescens (Decne) Borhidi comb. nova - Timor Isl.
- Basionym: *Cordia subpubescens* Decne Herb. Timor 67.
- Gerascanthus trichostemon (DC.) Borhidi comb. nova - Timor Isl.
- Basionym: *Cordia trichostemon* DC. Prodr. 9:482. 1845.
- Gerascanthus uncinulatus (DeWild) Borhidi comb. nova - Congo Belg.
- Basionym: *Cordia uncinulata* DeWild Rev. Zool. Afr. 9. Suppl. Bot. 89. 1921.
- Gerascanthus venosus (Hemsl.) Borhidi comb. nova - China
- Basionym: *Cordia venosa* Hemsl. J. Linn. Soc. 26:143. 1890.
- Gerascanthus vestitus (Hook. f. ex Thoms.) Borhidi comb. nova - India
- Basionym: *Cordia vestita* Hook. f. ex Thoms. J. Linn. Soc. 2:128. 1858.

According to our studies the following further species show calyptra-like opening of the calyx: *Cordia dodecandra* DC., *Cordia ecalyculata* Vell., *Cordia eriostigma* Pittier, *Cordia lutea* Lam. - *C. rotundifolia* Ruiz et Pav., *Cordia microcarpa* Killip, *Cordia silvestris* Fresen, taxa of very different systematic relations within the genus *Gerascanthus*. Motivated by these observations we did not maintain any systematic unit based on this feature.

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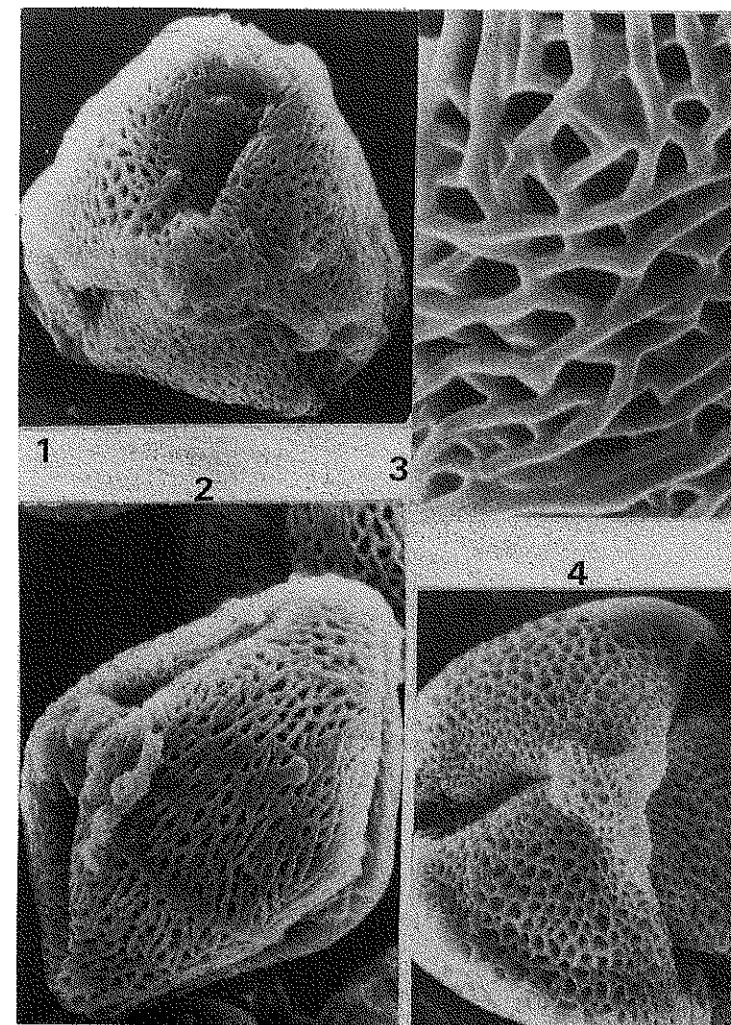


Plate I

- Fig. 1. Pollen of *Cordia boissieri*, apical view, 2000 x
- Fig. 2. Pollen of *Cordia boissieri*, lateral view, 2000 x
- Fig. 3. Exine structure of *Cordia boissieri*, 7800 x
- Fig. 4. Pollen of *Cordia dodecandra*, apical view, 2000 x

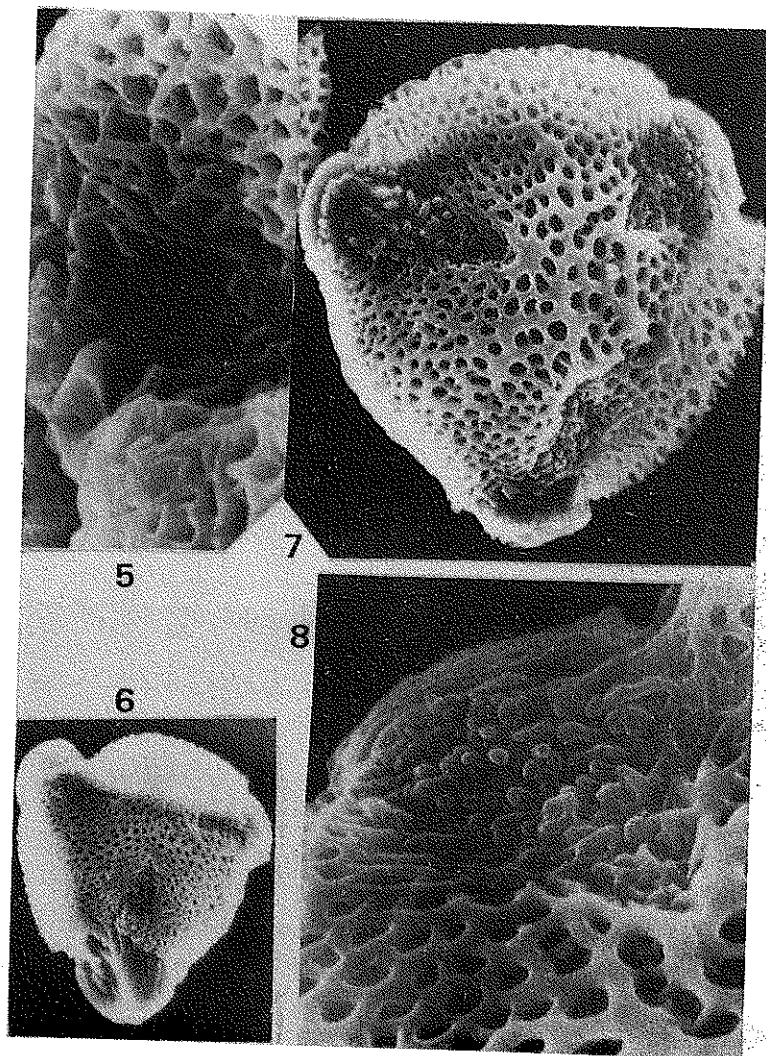


Plate II

- Fig. 5. Colpus and porus of the pollen of Cordia dodecandra, 7800 x
Fig. 6. Pollen of Cordia ensifolia with macrocolpi, 1000 x
Fig. 7. Pollen of Cordia ensifolia, apical view, 2000 x
Fig. 8. Structure of exine and colpus of Cordia ensifolia, 7800 x

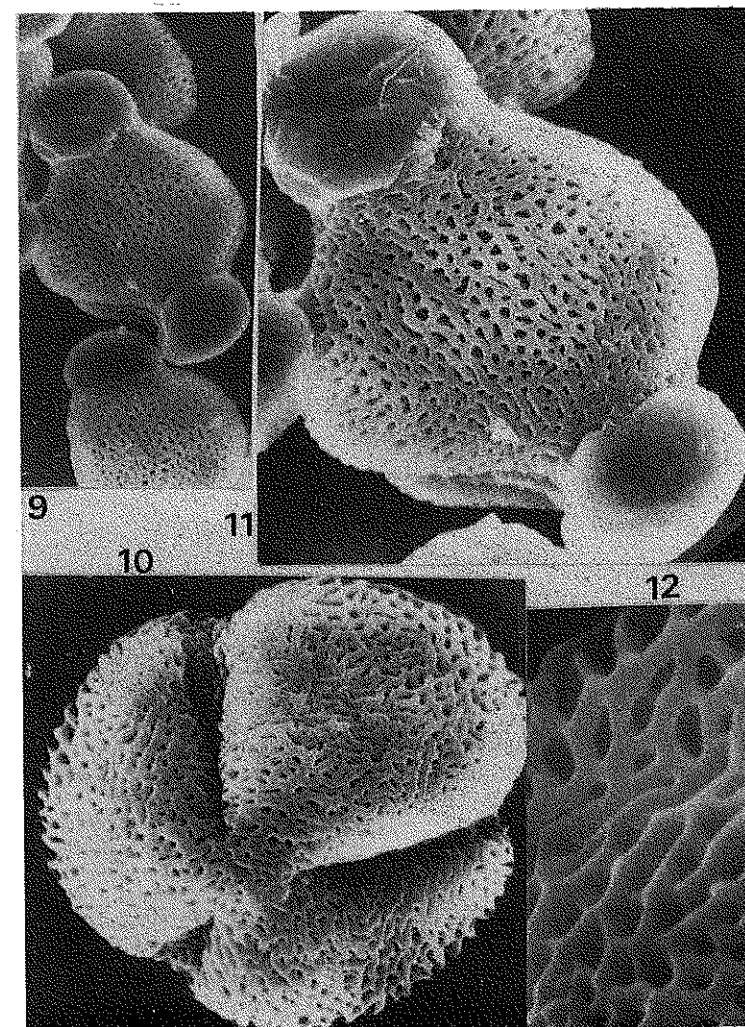


Plate III

- Fig. 9. Cordia sebestena, pollen with macrocolpi, 1000 x
Fig. 10. Pollen of Cordia sebestena, apical view, 2000 x
Fig. 11. Pollen of Cordia sebestena with colpi, 2000 x
Fig. 12. Exine structure of the pollen of Cordia sebestena, 7800 x

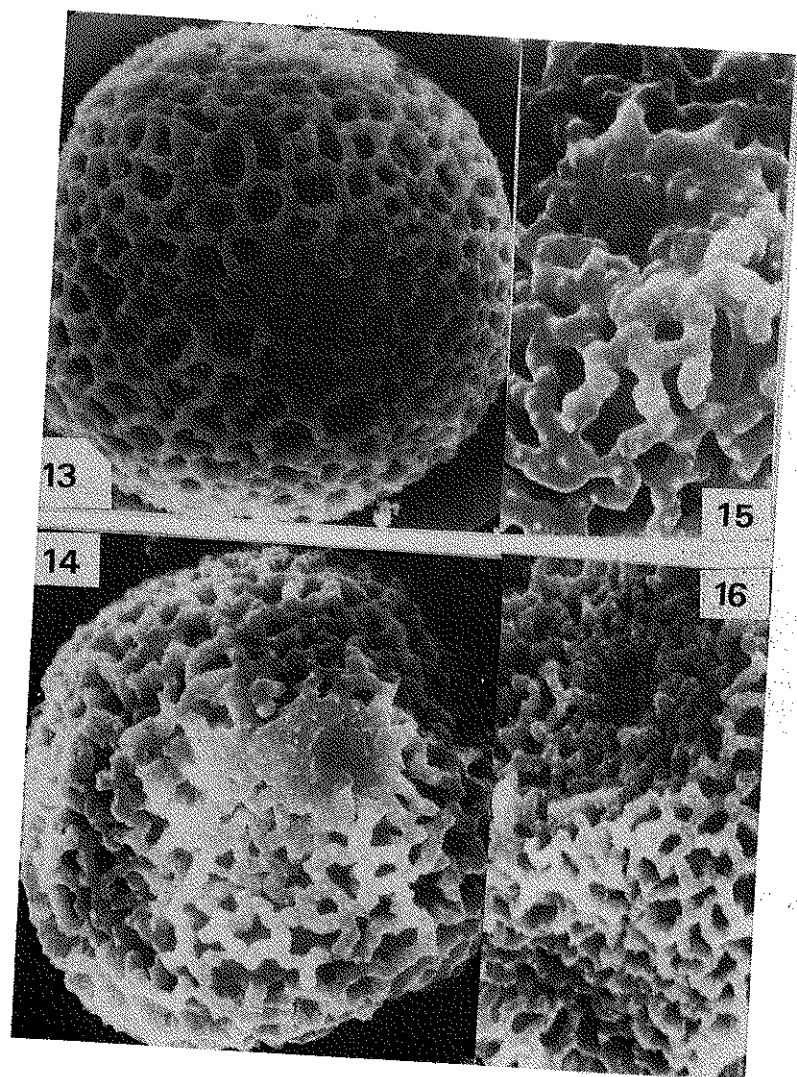


Plate IV

- Fig. 13. Pollen of *Varronia acuta*, 2000 x
 Fig. 14. Pollen of *Varronia anderssonii* with porus, 2000 x
 Fig. 15. Exine structure of *Varronia anderssonii*, 7800 x
 Fig. 16. Pollen of *Varronia anisodonta*, 2000 x

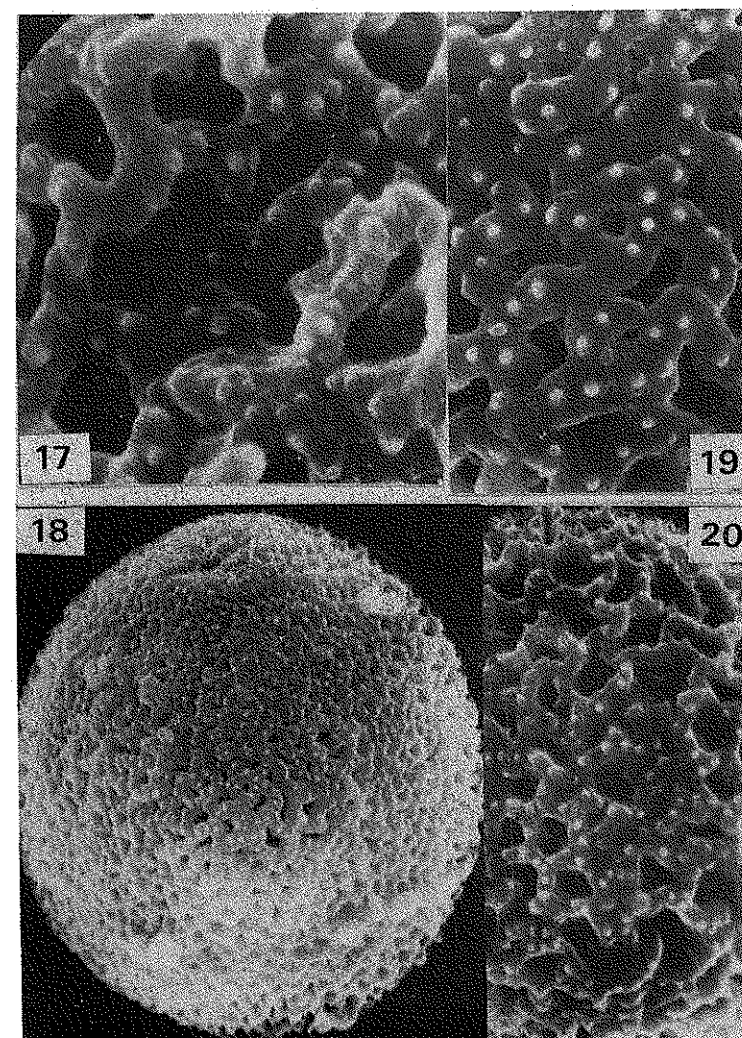


Plate V

- Fig. 17. Pollen of *Varronia anisodonta*, exine structure, 7800 x
 Fig. 18. Pollen of *Varronia cephalocarpa*, 2000 x
 Fig. 19. Exine structure of *Varronia cephalocarpa*, 7800 x
 Fig. 20. Exine structure of *Varronia chabrensis*, 3000 x

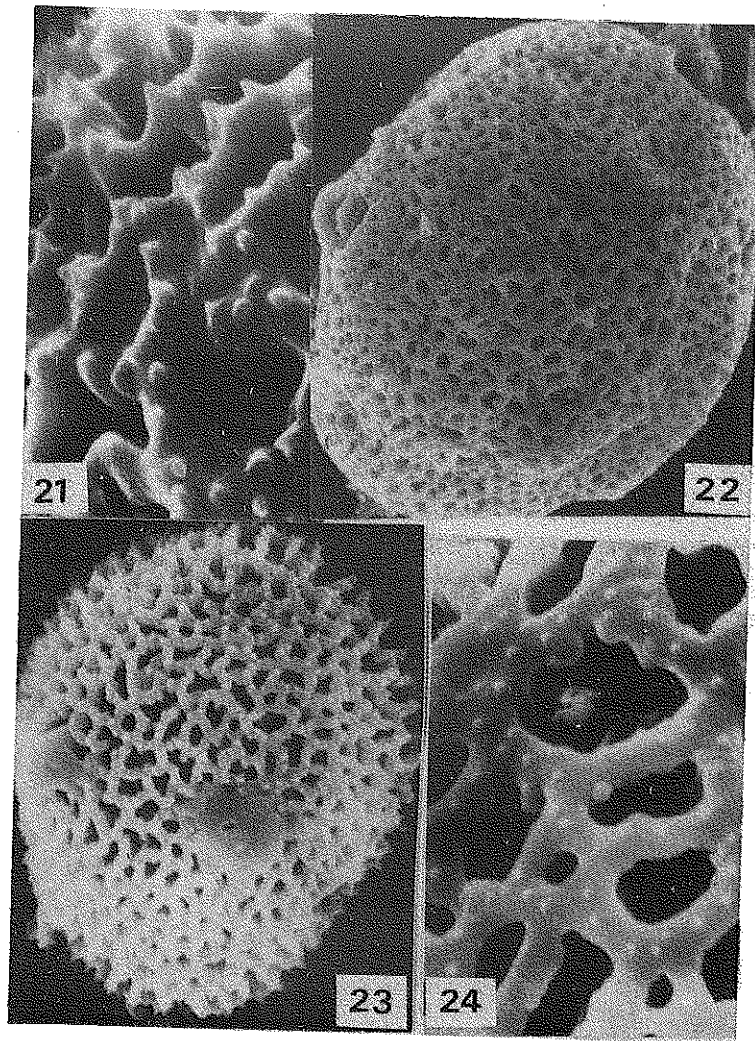


Plate VI

- Fig. 21. Pollen of *Varronia chabrensis*, 7800 x
 Fig. 22. Pollen of *Varronia lamprophylla*, 2000 x
 Fig. 23. Pollen of *Varronia macrocephala*, 1500 x
 Fig. 24. Exine structure of *Varronia macrocephala*, 7800 x

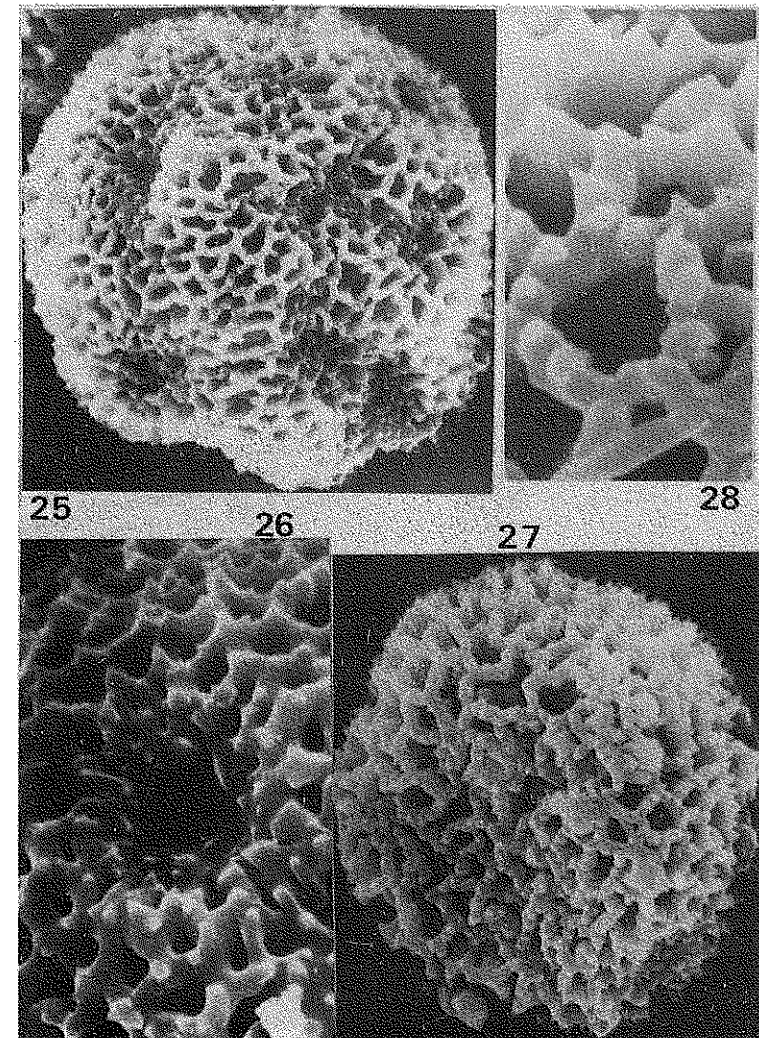


Plate VII

- Fig. 25. Pentaporate pollen of *Varronia serrata*, 2000 x
 Fig. 26. Porus and exine of *Varronia serrata*, 4000 x
 Fig. 27. Pollen of *Varronia nesophila*, 2000 x
 Fig. 28. Exine structure of *Varronia nesophila*, 7800 x

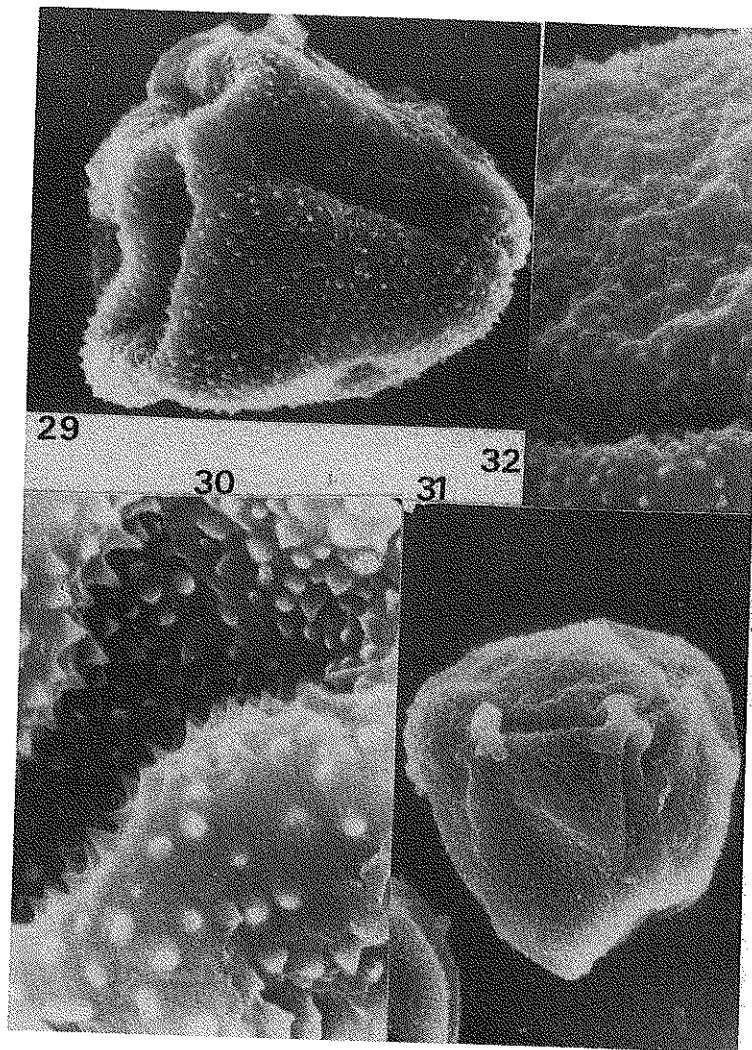


Plate VIII

- Fig. 29. Pollen of *Gerascanthus africanus*, apical view, 2000 x
Fig. 30. Exine structure of *Gerascanthus africanus*, 7800 x
Fig. 31. Pollen of *Gerascanthus albus*, 2000 x
Fig. 32. Exine structure of *Gerascanthus albus*, 7800 x

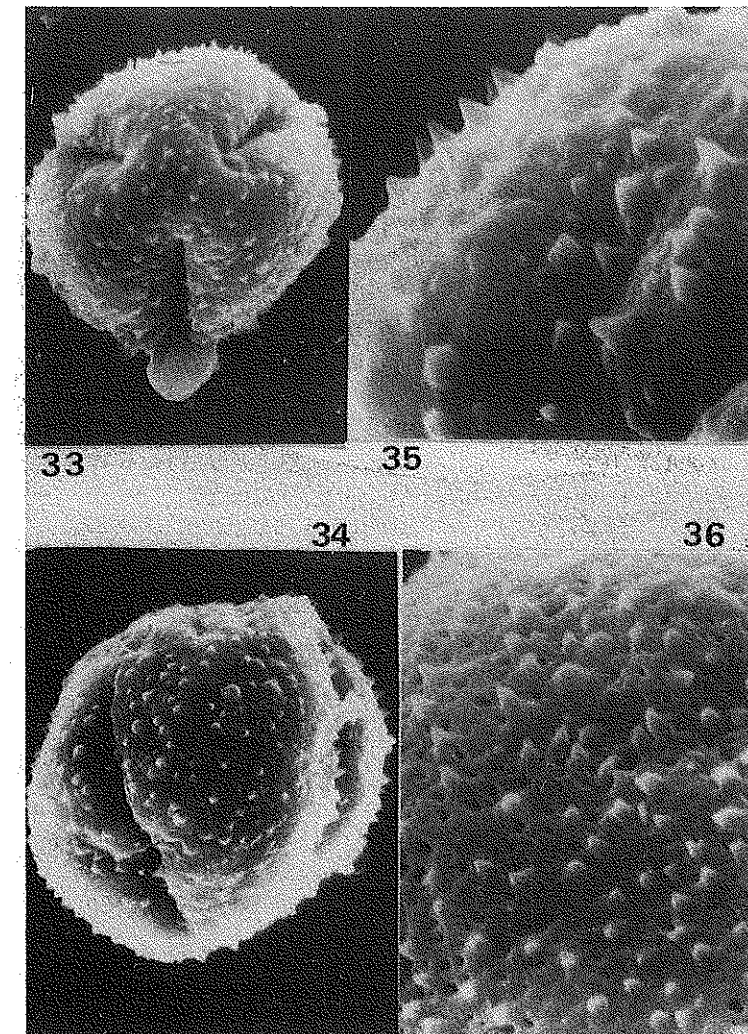


Plate IX

- Fig. 33. Pollen of *Gerascanthus alliodorus*, apical view, 2000 x
Fig. 34. Pollen of *Gerascanthus alliodorus*, lateral view, 2000 x
Fig. 35. Exine structure of *Gerascanthus alliodorus*, 7800 x
Fig. 36. Exine structure of *Gerascanthus asperus*, 7800 x

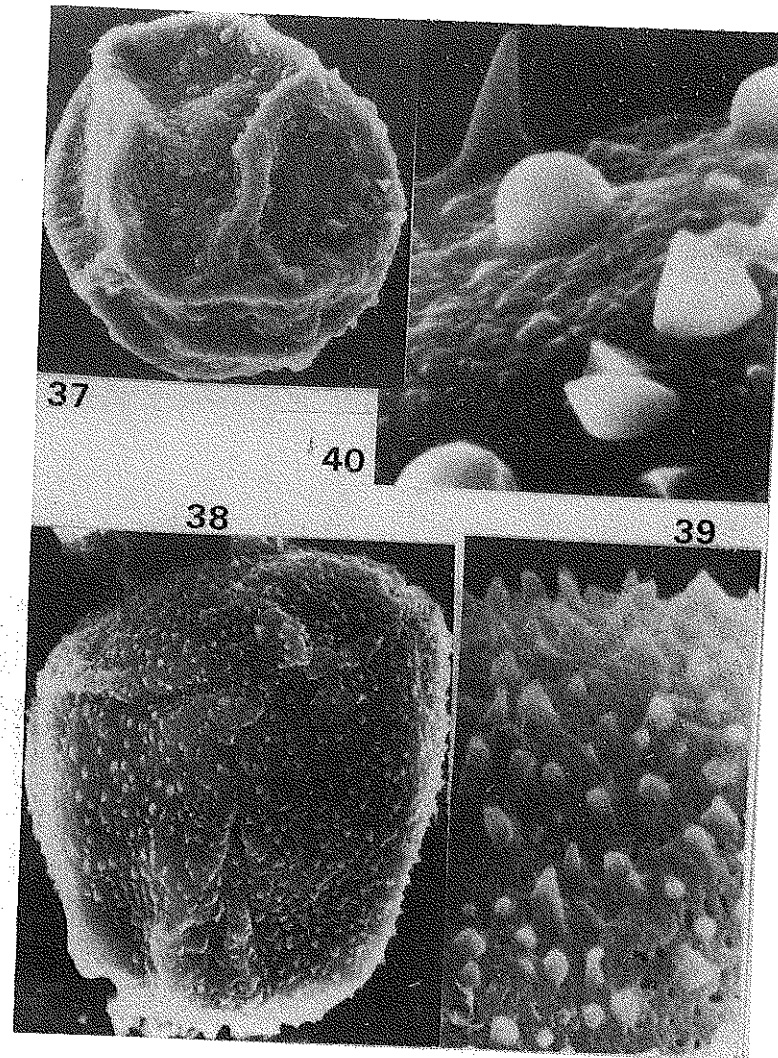


Plate X

- Fig. 37. Pollen of *Gerascanthus aurantiacus*, 2000 x
 Fig. 38. Pollen of *Gerascanthus caffra*, apical view, 2000 x
 Fig. 39. Exine structure of *Gerascanthus caffra*, 7800 x
 Fig. 40. Exine structure of *Gerascanthus collococcus*, 7800 x

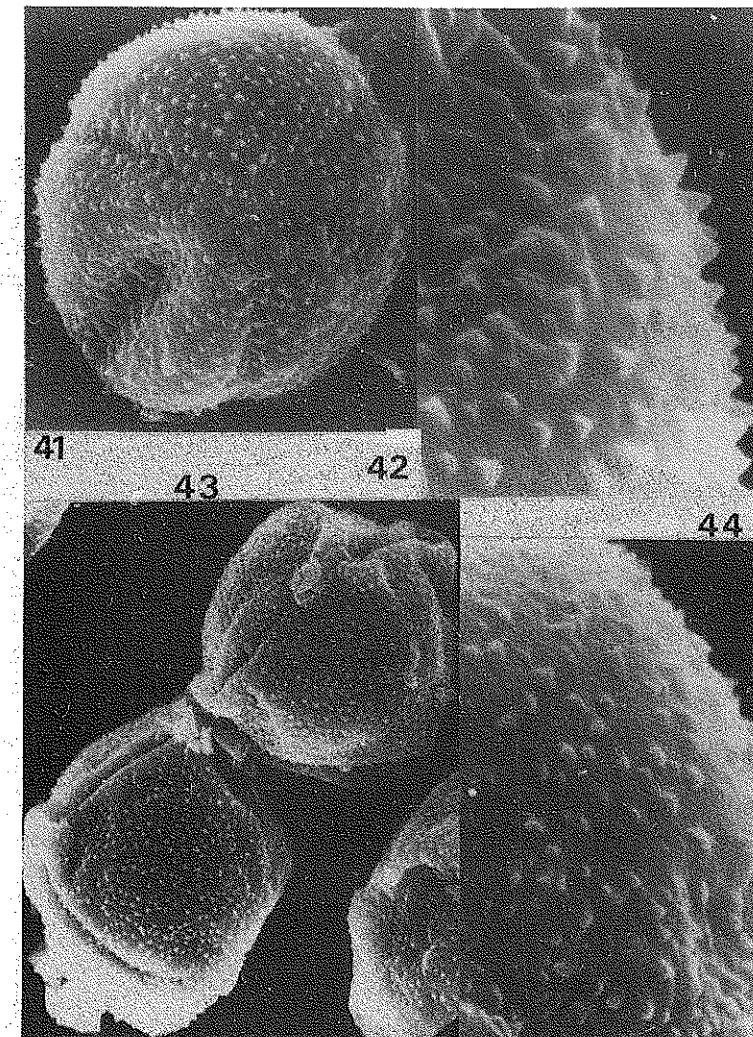


Plate XI

- Fig. 41. Pollen of *Gerascanthus millenii*, 2000 x
 Fig. 42. Exine structure of *Gerascanthus millenii*, 7800 x
 Fig. 43. Pollen of *Gerascanthus decandrus*, 2000 x
 Fig. 44. Exine structure of *Gerascanthus decandrus*, 7800 x

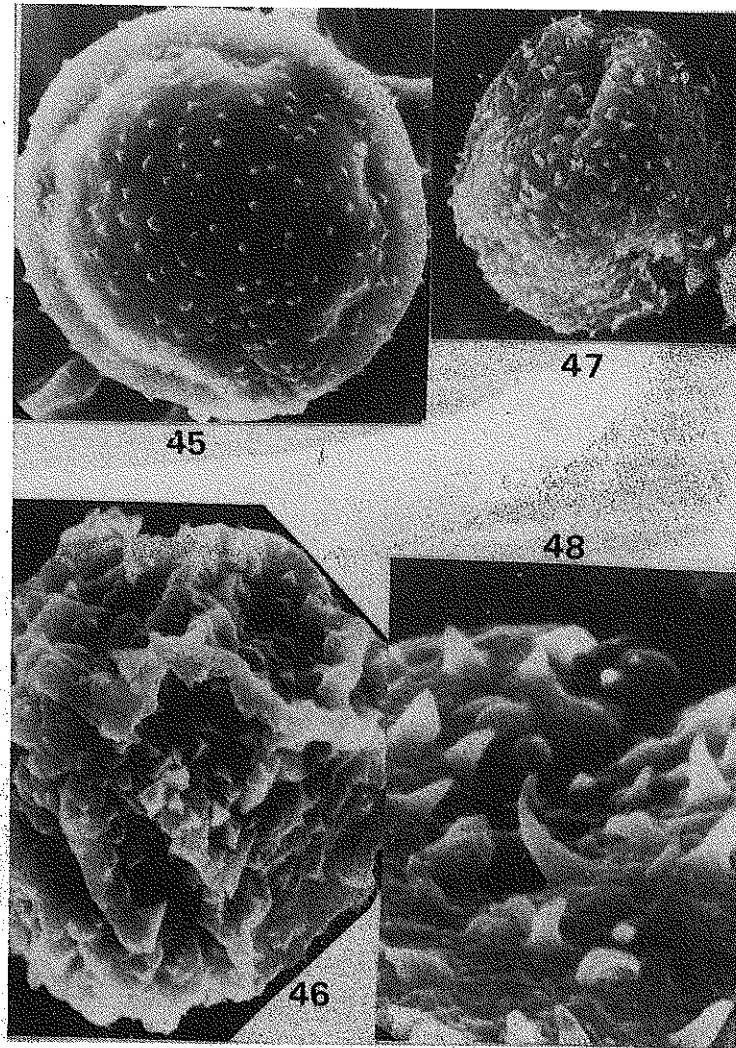


Plate XII

- Fig. 45. Pollen of *Gerascanthus ellipticus*, 2000 x
 Fig. 46. Pollen of *Gerascanthus eriostigma*, 3000 x
 Fig. 47. Pollen of *Gerascanthus gerascanthoides*, 2000 x
 Fig. 48. Exine structure of *Gerascanthus gerascanthoides*, 7800 x

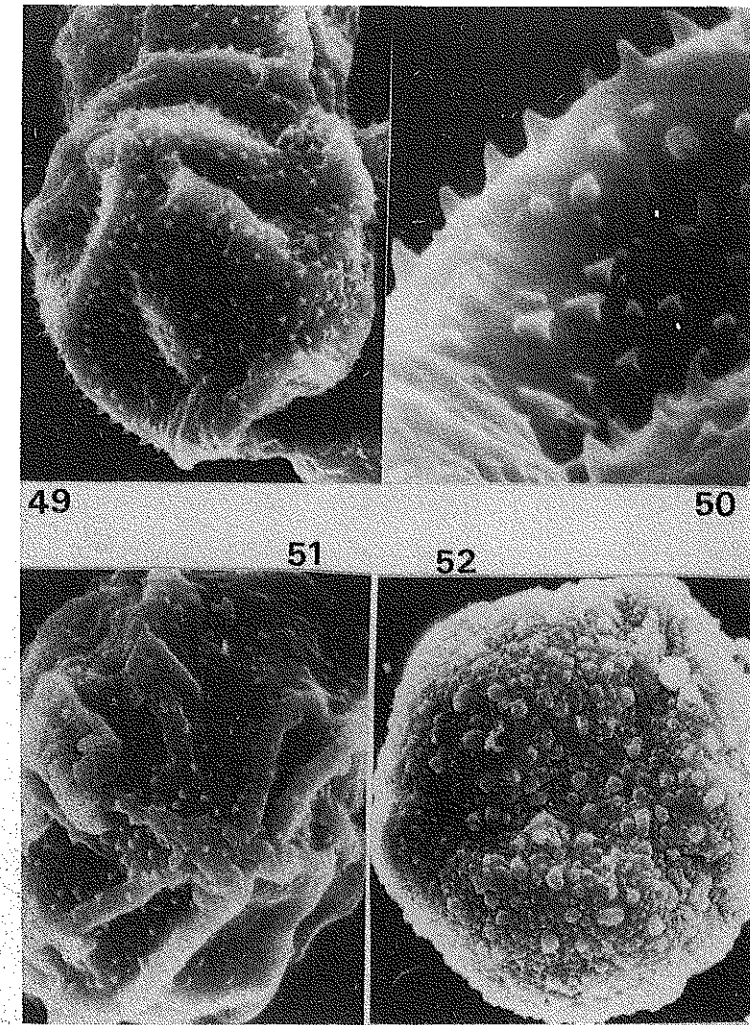


Plate XIII

- Fig. 49. Pollen of *Gerascanthus goetzei*, 2000 x
 Fig. 50. Exine of *Gerascanthus goetzei*, 7800 x
 Fig. 51. Pollen of *Gerascanthus griffithii*, 2000 x
 Fig. 52. Pollen of *Gerascanthus luteus*, 2000 x

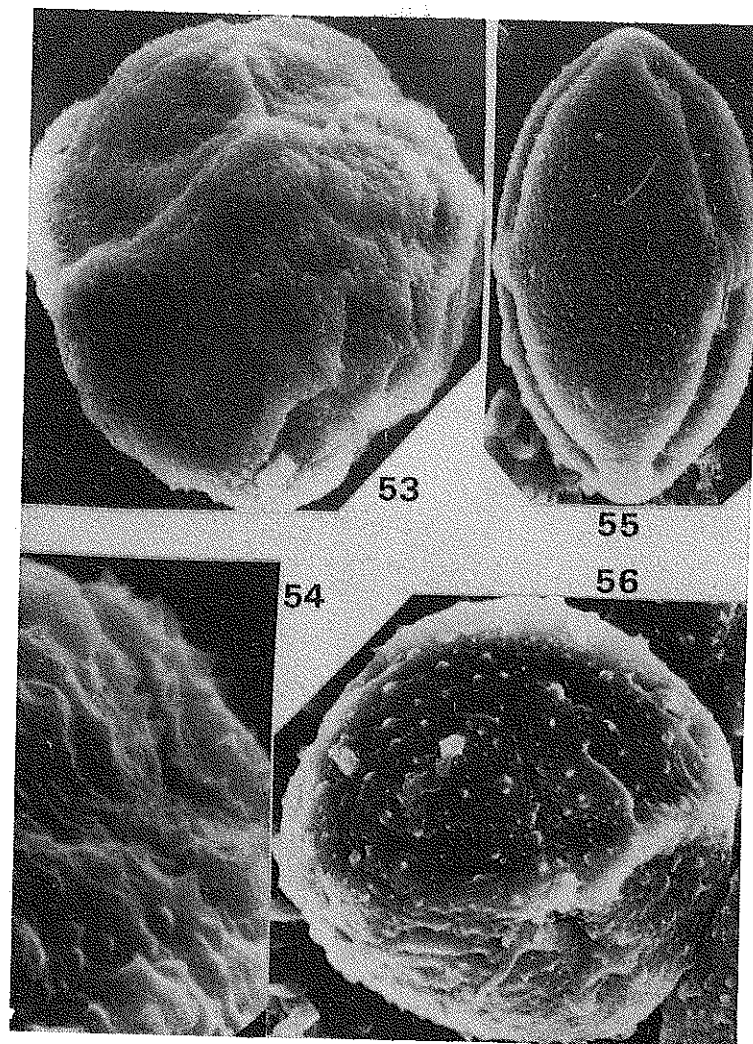


Plate XIV

- Fig. 53. Pollen of Gerascanthus myxus, 2000 x
Fig. 54. Exine structure of Gerascanthus myxus, 7800 x
Fig. 55. Pollen of Gerascanthus megalanthus, 2000 x
Fig. 56. Pollen of Gerascanthus nodosus, 2000 x

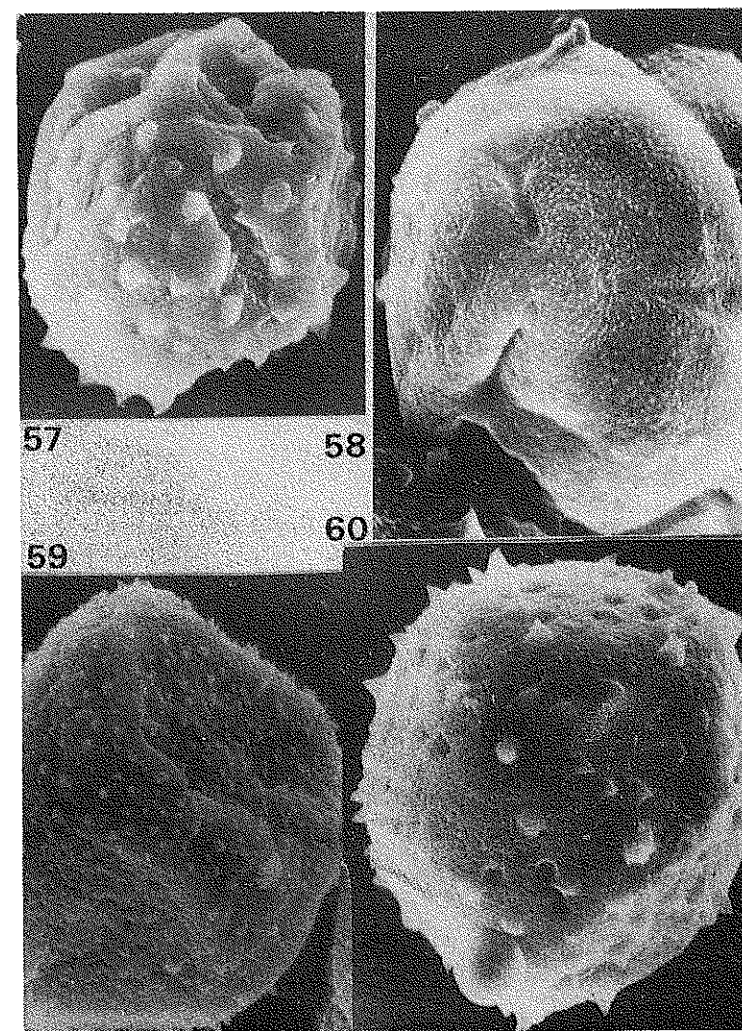


Plate XV

- Fig. 57. Pollen of Gerascanthus microcarpus, 2000 x
Fig. 58. Pollen of Gerascanthus obovatus, 2000 x
Fig. 59. Pollen of Gerascanthus sellowianus, 2000 x
Fig. 60. Pollen of Gerascanthus silvestris, 2000 x