

## A Taxonomic Study of the genus *Ascogaster* in China\* (Hymenoptera: Braconidae: Cheloninae)

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*Abstract.*—The chelonine genus *Ascogaster* is studied for the first time from the largely unknown area of mainland China and Taiwan. Twenty-three species are described and keyed, of which 13 are new to science and six are recorded for the first time from this area.

### INTRODUCTION

*Ascogaster* Wesmael is a cosmopolitan braconid genus whose species are parasitic upon microlepidoptera, predominantly Tortricidae. Some species have been recorded frequently as parasitoids of several economically important insect pests and have been considered for use in biological control programs. About 110 species of *Ascogaster* have been recorded in the world. Huddleston (1984) revised the 30 Palaearctic species; Tobias (1986a, 1986b, 1988) and Papp (1989) added 12 species to this region. Shaw (1983) reviewed 11 species for the Nearctic Region and described a related new genus, *Leptodrepana* (4 species). Walker and Huddleston (1987) recorded 12 species of *Ascogaster* in New Zealand. The fauna of the Indo-Australian Region is largely unknown, although Baker (1926) and Szépligeti (1905, 1908) described a few species. The *Ascogaster* fauna of China is especially poorly studied with only five species recorded, three from mainland China (Fahringer 1934; He, *et al* 1989) and two from Taiwan (Sonan 1932). In this work 23 species of *Ascogaster* in China are treated, of which 13 species are new to science and six are recorded for the first time from China.

### MATERIALS AND METHODS

Approximately 1,200 specimens of Chinese *Ascogaster* were examined in this study, mostly from the collections of the Fujian Agricultural College, the Zhejiang Agricultural University, the Zoology Research Institute of Academia Sinica, the Taiwan Agricultural Research Institute and the American Entomological Institute. The following acronyms are used to identify collections that provided specimens for this study and several as the depositories for type material:

- AEIG American Entomological Institute, Gainesville, Florida, USA
- BM Bishop Museum, Honolulu, Hawaii, USA
- CNC Canadian National Collection, Agriculture Canada, Ottawa, Canada
- ELKU Entomological Laboratory, Kyushu University, Fukuoka, Japan
- FAC Biological Control Research Institute, Fujian Agricultural College, Fuzhou, China
- HNHM Hungarian Natural History Museum, Budapest, Hungary
- IRSNB Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium
- TARI Taiwan Agricultural Research Institute, Wufeng, Taiwan
- UEI Entomological Institute, Hokkaido University, Sapporo, Japan
- USNM National Museum of Natural History, Washington, D. C., USA
- ZAU Department of Plant Protection, Zhejiang Agricultural University, Hangzhou, China

\*Throughout this paper, China includes mainland China and Taiwan.

ZRI Zoology Research Institute, Academia Sinica, Beijing, China

We also examined available Palaearctic and Indo-Australian material in the U. S. National Museum of Natural History and some type material from other institutions as follows: USNM - *abdominator* Dahlbom, *albitarsus* Reinhard, *annularis* Nees von Esenbeck, *atamiensis* Ashmead (holotype, synonymized with *bidentula* Wesmael by Huddleston 1984), *bicarinata* Herrich-Shaffer, *bidentula* Wesmael, *brevicornis* Wesmael, *canifrons* Wesmael, *cinctus* Baker (holotype), *coelioxoides* (Baker) (holotype), *consobrina* Curtis, *detectus* Baker (holotype), *distinctus* Baker (holotype), *fullawayi* (Baker) (type series), *inconspicuus* Baker (holotype), *intensus* Baker (holotype), *laeviventris* Baker (holotype), *longulus* Baker (holotype), *luzonensis* Baker (holotype), *maculaticeps* Baker (holotype), *malayanus* (Baker) (holotype), *modestus* Baker (holotype), *philippinensis* Baker (type series), *quadridentata* Wesmael, *reticulata* Watanabe (type series), *rufidens* Wesmael, *rufipes* (Latreille), *vividus* Baker (holotype); BM - *argentea* Fullaway (syntypes); *rugosa* Fullaway (holotype); IRSNB - *armata* Wesmael (lectotype), *bidentula* Wesmael (lectotype), *brevicornis* Wesmael (lectotype), *canifrons* Wesmael (lectotype); *limitatus* Wesmael (syntypes, synonymized with *scabricula* (Dahlbom) by Huddleston 1984), *quadridentata* Wesmael (type-series), *rufidens* Wesmael (type-series), *varipes* Wesmael (type series); UEI - *epinotiae* Watanabe (type series, synonymized with *quadridentata* Wesmael by Huddleston 1984); *reticulata* Watanabe (type series); ELKU - *longicornis* Huddleston (holotype, synonymized with *formosensis* Sonan, new synonymy); HNHM - *nilena* Papp (holotype).

The general braconid morphological terminology and measurements used in this study are mostly after van Achterberg (1988). The terminology used for wing veins is illustrated and explained in Sharkey (1988). Microsculpture terms are based on Harris (1979). Two character states of the ocellar triangle are defined after Huddleston (1984) as follows: where a straight line drawn between the anterior borders of posterior ocelli also touches the anterior ocellus, the ocelli are referred to as being 'on line'; where a line between the posterior ocelli passes behind the anterior ocellus without touching it, the ocelli are referred to as being 'not on line'. The measurements OO and OD refer,

respectively, to the ocellar-ocular distance and the diameter of the posterior ocellus. The ratio CL/CW is carapace length (CL) to carapace width (CW). Shaw (1983) and Huddleston (1984) discussed the important taxonomic characters of *Ascogaster* in detail and we have used most of the specific characters used by Huddleston (1984) for the description of new species in this study (see discussion under generic diagnosis). All dates from labels on specimens examined have been standardized thus, I-1-93, to avoid confusion.

## BIOLOGY

Members of *Ascogaster*, like all the chelonines, are internal egg-larval parasitoids of microlepidoptera, principally Tortricidae. They lay their eggs into the host egg, but their larval development is delayed at the first instar until the host larva is mature. Little detailed work has been done on the biology of *Ascogaster*. Huddleston (1984) and Shaw (1983) reviewed the hosts of *Ascogaster* for the Palaearctic and Nearctic Regions respectively. Cox (1932), Rosenberg (1934) and Boyce (1936) gave fairly detailed accounts of the biology of *A. quadridentata* Wesmael. A research group in Japan has recently studied in some detail host-searching, host-preference, mating and oviposition behavior of *A. reticulata* Watanabe, an important parasitoid of the smaller tea tortix, *Adoxophyes* sp., in Japan (Kainoh 1986, 1988; Kainoh, *et al.* 1982; Kainoh, *et al.* 1991; Kainoh and Tamaki 1982, 1988; Kainoh, *et al.* 1990; Kainoh, *et al.* 1989; Kamano, *et al.* 1989; Kawakami 1985; Kawakami and Kainoh 1985, 1986). Little is known at present about the biology of the Chinese *Ascogaster* species, however He *et al.* (1987) gave a full host list of *A. reticulata* in mainland China.

## SYSTEMATICS

The Cheloninae are distinguished from all other subfamilies of Braconidae by the combination of having the first three metasomal terga fused to form a carapace (Figs. 21-26), having a complete postpectal carina and three submarginal cells in the forewing (Fig. 1). Two tribes of the Cheloninae, Chelonini and Phanerotomini, are represented in the Palaearctic and Indo-Australian regions. In the Phanerotomini the carapace is divided into three tergites by two transverse su-

tures; in the Chelonini the carapace has no trace of sutures. The Chelonini are represented in the Palaearctic and Indo-Australian regions by three genera, *Ascogaster* Wesmael, *Megascogaster* Baker and *Chelonus* Panzer. The former two genera can be separated from *Chelonus* by having the first submarginal cell always separated from the discal cell by vein 1-Rs+M (Rs+M of some authors) (Fig. 1). Many authors (e.g. Baker 1926; Shaw 1983; Huddleston 1984; Walker and Huddleston 1987; van Achterberg 1990b; Zettel 1990) state that *Ascogaster* is also characterized by having hairless eyes. However, we have described one new species, *A. setula* from Taiwan, with eyes densely and distinctly setose (Fig. 8), but with most of the other characters of typical *Ascogaster*. We include it within *Ascogaster* until more species with this unusual character have been found. *Megascogaster* Baker is distinguished from *Ascogaster* only by having a very elongate carapace (distinctly longer than head and thorax) and a slender stigma in the forewing. The taxonomic position of *Megascogaster* Baker must wait until more material from the Indo-Australian region has been studied. Shaw (1983) cited thirteen characters for distinguishing *Ascogaster* and *Leptodrepana*, however intermediate forms of most characters occur in many undescribed Indo-Australian *Ascogaster* which we have

examined and we have chosen to follow van Achterberg's synonymy. This concept makes *Ascogaster* an apparent polyphyletic group and we feel that a thorough phylogenetic study of the entire genus is needed before the correct position of *Leptodrepana* and the many other unusual forms from the Indo-Australian Region can be settled. That is beyond the scope of this limited study which aims only to identify species from the previously unknown area of China.

*Ascogaster* Wesmael

*Ascogaster* Wesmael 1835:226. Type-species: *Ascogaster instabilis* Wesmael [= *abdominator* (Dahlbom)], subsequently designated by Foerster (1862).

*Cascogaster* Baker 1926:482. Type-species: *Cascogaster fullawayi* Baker, original designation; syn. by Watanabe (1937).

*Leptodrepana* Shaw 1983:37. Type-species: *Leptodrepana opuntiae* Shaw, original designation; syn. by van Achterberg (1990b).

*Diagnosis.*—Distinguished from all other braconid genera by having: (a) the first three metasomal terga fused into a rigid carapace without transverse sutures; and (b) the forewing with three submarginal cells and vein 1-Rs+M present, separating the first submarginal and discal cells.

KEY TO THE ASCOGASTER SPECIES OF CHINA

- 1 Face punctate or rugose-punctate, occasionally nearly smooth; mesonotum usually predominantly punctate, notauli usually distinct ..... 2
- Face strongly areolate or areolate-rugose, at least finely areolate-rugose; mesonotum usually coarsely areolate-rugose so that notauli often are indistinct ..... 13
- 2(1) Setae on upper part of face pointing upwards; ocellar triangle acute, ocelli usually not on line or almost on line; propodeum without mediodorsal and apicolateral tubercles ..... 3
- Setae on upper part of face pointing downwards; ocellar triangle always obtuse, ocelli usually on line; propodeum with distinct mediodorsal and apicolateral tubercles ..... 6
- 3(2) Clypeus with conspicuous dentate flanges laterally; legs completely black or sometimes fore tibia reddish-brown; ovipositor sheaths broad, knife-like ..... *semenovi* Telenga
- Clypeus without dentate flanges laterally; legs mostly yellow or yellow-brown; ovipositor sheaths not conspicuously broad and knife-like ..... 4
- 4(3) Clypeus with a large median incision apically; female carapace with a conspicuous dorsal prominence at base ..... *dimorpha* Tang and Marsh, new species
- Clypeus without any medial apical tubercle or incision; carapace without a dorsal prominence at base ..... 5
- 5(4) Vein r of forewing about 1.0-1.2 times as long as 3-RS; hind coxa of male completely yellow ..... *townesi* Tang and Marsh, new species
- Vein r of forewing about twice as long as 3-RS; hind coxa of male mostly black ..... *yunnanica* Tang and Marsh, new species

- 6(2) Eyes distinctly setose; antennae short, with 26-29 flagellomeres; body 2.9-3.1 mm .....  
 ..... *setula* Tang and Marsh, new species
- Eyes without setae or at most with only a few minute setae; antennae longer, generally with more than  
 30 flagellomeres; body generally more than 3.2 mm ..... 7
- 7(6) Mesopleuron completely coarsely areolate-rugose so that precoxal suture not distinct; antennae very  
 long, 45-49 flagellomeres; apical border of clypeus weakly marginate medially ..*formosensis* Sonan
- Mesopleuron at least in part smooth or punctate, precoxal suture usually distinct (except *varipes*);  
 antennae shorter, at most with 40 flagellomeres; apical border of clypeus either produced or with one  
 or two small tubercles ..... 8
- 8(7) Apical border of clypeus transversely impressed and produced medially but without medial excision or  
 tubercles ..... 9
- Apical border of clypeus with one or two distinct teeth medially ..... 11
- 9(8) Hind coxa strongly strigate; carapace short, oval in dorsal view; mandible at base with a deep,  
 semicircular depression ..... *varipes* Wesmael
- Hind coxa largely smooth or finely punctate; carapace elongate, clavate in dorsal view; mandible at base  
 with vertical, parallel-sided depression ..... 10
- 10(9) Legs yellow except hind coxa at base black, apex of hind femur and tarsi infusate *consobrina* Curtis
- Legs black except tibiae at base and basal tarsus of hind leg ivory or pale yellow *albitarsus* Reinhard
- 11(8) Apical border of clypeus with two medial tubercles, generally with a small excision between them; if  
 excision absent, then medial clypeal border with a narrow, spatulate projection, but never a medial  
 tooth ..... *arisanica* Sonan
- Apical border of clypeus with a single medial pointed tooth ..... 12
- 12(11) Carapace short, oval, broadest at about middle point in dorsal view; ventral opening of carapace shorter  
 in front of apex; hind coxa completely yellow ..... *perkinsi* Huddleston
- Carapace longer, clavate, broadest in posterior third in dorsal view; ventral opening of carapace long at  
 apex of carapace; hind coxa predominantly black ..... *lini* Tang and Marsh, new species
- 13(1) Carapace elongate, CL/CW more than 2.0 ..... 14
- Carapace shorter, usually oval, CL/CW generally 1.7 or less, never more than 2.0 ..... 15
- 14(13) Hind coxa strigate and black; ventral opening of carapace short, reaching only slightly beyond middle  
 of carapace ..... *grandis* Tang and Marsh, new species
- Hind coxa smooth or finely punctate, yellow; ventral opening of carapace longer, reaching apical 1/4 of  
 carapace ..... *macrogaster* Tang and Marsh, new species
- 15(13) Gena long and straight in face view; hind coxa strigate and yellow *chaoi* Tang and Marsh, new species
- Gena more or less rounded in face view; hind coxa often punctate or if strigate, then always mostly black  
 ..... 16
- 16(15) Interantennal carina strongly raised into an erect triangular flange between scapes ..... 17
- Interantennal carina present but never strongly raised into a triangular flange between scapes ..... 19
- 17(16) Carapace rounded, without a tubercle apically; clypeus matte, rugose-punctate, its apical border straight  
 with no medial tooth ..... *armatoides* Tang and Marsh, new species
- Carapace apically pointed, with a tubercle at apex; clypeus smooth, sparsely punctate, its apical border  
 pointed with a medial tooth ..... 18
- 18(17) Carapace oval; face and temple areolate-rugose ..... *acutus* Tang and Marsh new species
- Carapace acutely pointed; face and temple strongly and coarsely rugose ..... *fullawayi* (Baker)
- 19(16) Hind coxa smooth, or finely punctate, yellow or infusate at base; hind tibia with a medial pale colored  
 band; clypeus transversely impressed apically, without a medial tooth or if with a medial tooth, then  
 lower part of face smoother than upper part ..... 20
- Hind coxa strigate, at least at part, always black; hind tibia generally completely black or pale at base,  
 but never with a medial pale-colored band medially; clypeus always with a distinct medial tooth; face  
 evenly areolate or strongly areolate-rugose ..... 21
- 20(19) Clypeus matte, rugose-punctate, straight apically, with no medial tooth; face strongly areolate .....  
 ..... *reticulata* Watanabe
- Clypeus smooth, finely and sparsely punctate, with a distinct medial apical tooth; face finely areolate-  
 rugose ..... *rugulosa* Tang and Marsh, new species
- 21(19) Anterior corners of middle mesonotal lobe swollen, notauli distinct; palpi black .....  
 ..... *gibbosa* Tang and Marsh, new species

- Anterior corners of middle mesonotal lobe not swollen, notauli indistinct; palpi yellow or reddish-brown ..... 22
- 22(21). Temple short, about equal in width to eye in dorsal view; carapace short, oval in dorsal view, deep in lateral view ..... *quadridentata* Wesmael
- Temple rounded, distinctly longer than eye in dorsal view; carapace longer, clavate in dorsal view, not so deep in lateral view ..... *hei* Tang and Marsh, new species

***Ascogaster acutus* Tang and Marsh,**  
new species  
Fig. 23

*Female*.—Length of forewing 2.5-2.7 mm, of body 3.0-3.2 mm.

*Head*.—Antenna with 28-32 flagellomeres, slightly dilated medially, medial flagellomeres slightly broader than long, apical ones longer than broad. Temple slightly contracted behind eyes, distinctly longer than length of eye in dorsal view. Occiput strongly concave. Ocelli small, on line, OO= 4.0 OD. Frons strongly depressed, finely rugose or smooth, medial carina distinct, extending from upper part of face between antennae to anterior ocellus and strongly expanded between antennae into an erect triangular lamella. Eyes protuberant, glabrous. Face slightly protuberant, about twice as broad as high, strongly areolate-rugose. Clypeus punctate, strongly divided from face, apical border produced medially into a small pointed tooth.

*Mesosoma*.—Pronotum slightly projecting in front of mesonotum, dorsolaterally rugose-punctate. Notauli not distinct; mesonotum completely coarsely rugose. Precoxal suture indistinguishable; mesopleuron strongly rugose. Propodeum coarsely areolate-rugose, divided by a transverse carina which is raised into a medial pair and a lateral pair of dentate flanges. Hind coxa strigate. Vein r of forewing about 1.0-1.5 times as long as 3-RS.

*Metasoma*.—Carapace (Fig. 23) short, with pointed tubercle at apex, areolate-rugose. Ventral opening of carapace longer, not distinctly in front of apex. Ovipositor concealed.

*Color*.—Black; carapace yellow at base; all legs yellow except hind coxa at base, tibia at apex and tarsi black.

*Male*.—Same as females except antenna not dilated medially, smaller yellow spot at basal carapace.

*Holotype Female*.—BEIJING CITY: Mentougou, VIII-25-81, M. S. Shi. Deposited in ZAU.

*Paratypes*.—BEIJING CITY: 1 female, Lugouqiao, IX-57, T. L. Chen; 1 male, IX-78, J. H. He. GUIZHOU PROVINCE: 1 female, Guiyang, V-13-85, Q. H. Luo. FUJIAN PROVINCE: 1 female, Shaowu, VII-20-45, H. F. Chao; 1 female, Shanhan, VII-19-21-88, Y. Ma. TAIWAN: 1 female Dutuanpi, VIII-5-82, K. C. Chou and C. N. Lin; 1 female, Wushe, IV-13-83, H. Townes; 1 female, Wushe, IV-19-83, H. Townes; 1 female, Wushe, V-3-83, H. Townes; 2 females, Wushe, V-10-83, H. Townes; 1 male, Wushe, V-15-83, H. Townes. Deposited in AEIG, FAC, TARI, ZAU and ZRI.

*Host*.—Unknown.

*Distribution*.—China (Beijing City, Guizhou Province, Fujian Province), Taiwan.

*Remarks*.—This species is very close to *fullawayi* (Baker) from which it can be distinguished by the characters mentioned in the key.

*Etymology*.—The specific name is from the Latin *acutus* meaning pointed in reference to the pointed tubercle at the apex of the carapace.

***Ascogaster albitarsus* Reinhard**

*Ascogaster albitarsus* Reinhard 1867: 364. Lectotype male, POLAND: Gdansk (designated by Huddleston 1984). Shenefelt 1973: 815; Huddleston 1984: 364; Papp 1989: 297.

*Ascogaster leptopus* Thomson 1874: 584. Lectotype female, SWEDEN (designated by Huddleston 1984 and syn. by Hellen 1953)

*Diagnosis*.—Length of forewing 3.3-3.5 mm, of body 3.9-4.0 mm. Antenna with 36-38 flagellomeres, slightly dilated medially (female); ocelli almost on line; face about 1.5 times as broad as high, rugose-punctate; clypeus with its apical border produced medially and slightly reflexed forwards; notauli distinct, foveolate, coalescing posteriorly in a large areolate-rugose area, rest of mesonotum densely areolate-punctate; precoxal suture strongly areolate-rugose anteriorly, rather weak posteriorly, mesopleuron anterodorsally strongly rugose, rest of mesopleuron finely punctate; hind leg predominately dark with base of

tibia and tarsus pale-yellow; hind coxa finely punctate; carapace long, clavate and widest in posterior third.

*Specimens Examined*.—HEBEI PROVINCE: 2 females. SICHUAN PROVINCE: 2 females.

*Additional Specimens Examined*.—WESTERN EUROPE: 1 male, det. by Huddleston, 1983.

*Host*.—A tortricid moth on pine tree.

*Distribution*.—China (Hebei Province, Sichuan Province), Korea and some European countries.

*Remarks*.—Our specimens from China have the mesopleuron with a polished impunctate area posteroventrally, but otherwise agreeing with the redescription of Huddleston (1984)

### *Ascogaster arisanica* Sonan

Fig. 3

*Ascogaster arisanicus* Sonan 1932: 79. Holotype male, TAIWAN: Alishan (=Arisan). Watanabe 1937: 77 (as syn of *rufipes* (Latreille)); Chou 1981: 72 (notes on the locality of types).

*Ascogaster arisanica* Sonan: emended by Huddleston 1984: 365.

*Diagnosis*.—Length of forewing 2.9-3.2 mm, of body 3.3-3.7 mm. Antenna with 34-38 flagellomeres, moderately dilated medially (female); ocellar triangle obtuse, ocelli almost on line; face (Fig. 3) about 1.5 times as broad as high, densely punctate or rugose-punctate; apical border of clypeus produced, with a distinct medial excision flanked by two small tubercles; notauli shallow, coarsely rugose, coalescing posteriorly in an areolate-rugose area, rest of mesonotum punctate or rugose-punctate; precoxal suture broad, shallow, foveolate; rest of mesopleuron sparsely punctate except dorsally rugose; hind coxa finely punctate; carapace elongate, broadest in distal half; ventral opening of carapace conspicuously in front of apex.

*Specimens Examined*.—ZHEJIANG PROVINCE: 16 females, 9 males. SICHUAN PROVINCE: 2 females. YUNNAN PROVINCE: 1 male. GUANGXI PROVINCE: 1 female. HAINAN PROVINCE: 1 female. TAIWAN: 115 females, 35 males.

*Host*.—Unknown.

*Distribution*.—China (Zhejiang Province, Sichuan Province, Yunnan Province, Guangxi Province, Hainan Province), Taiwan, Japan.

*Remarks*.—Huddleston (1984) stated that "This

species is structurally very close to *bidentula*, but it can be distinguished by the more massive head and the more elongate carapace." However, our specimens generally have the heads not so massive as described by Huddleston. In Chinese specimens examined here, the temple is only 1.0-1.3 times as long as eye in dorsal view. Sonan (1932) named this species as *arisanicus*, however, the holotype is labelled '*Ascogaster arisensis* Sonan'.

### *Ascogaster armatoides* Tang and Marsh, new species

Fig. 19

*Female*.—Length of forewing 3.5-3.6 mm, of body 4.2-4.4 mm.

*Head*.—Antenna with 42 flagellomeres, moderately dilated medially, medial segments about as broad as long. Temple constricted behind eyes, slightly shorter than length of eye in dorsal view. Occiput strongly concave. Ocelli very small, on line, OO = 4.0 OD. Frons strongly excavate behind antennae, smooth, with a distinct medial carina which is expanded between antennae into an erect triangular flange (Fig. 19). Eyes glabrous, strongly protuberant. Face slightly protuberant, about 1.5 times as broad as high, strongly areolate-rugose. Clypeus dull, rugose-punctate, not very distinctly divided from face; apical border convex, not produced medially and without distinct tooth or tubercle.

*Mesosoma*.—Pronotum slightly projecting in front of mesonotum, areolate-rugose laterally. Notauli indistinct; mesonotum strongly rugose. Precoxal suture indistinct; mesopleuron completely areolate-rugose. Propodeum strongly areolate-rugose, divided into dorsal and posterior surfaces by a transverse carina which is raised into a pair of medial blunt teeth and laterally a pair of less stout teeth. Hind coxa strongly strigate. Vein r of forewing about as long as 3-RS.

*Metasoma*.—Carapace short, CL/CW = 1.6, oval in dorsal view, somewhat pointed in lateral view, areolate-rugose. Ventral opening of carapace short, in front of apex. Ovipositor concealed.

*Male*.—Unknown.

*Holotype Female*.—GUANGXI PROVINCE: Longzhou, V-18-82, J. H. He. Deposited in ZAU.

*Paratypes*.—INDIA: 4 females, Anumatti, S. Coorg, II-52, P. S. Nathan. Deposited in CAN, USNM.

*Host*.—Unkown.

*Distribution*.—China (Guangxi Province), India.

*Remarks*.—This species is very close to *armata* Wesmael from which it can be distinguished by its longer antenna and less massive head.

*Etymology*.—The specific name is in reference to the similarity of this species to *armata*.

***Ascogaster chaoi* Tang and Marsh, new species**

*Female*.—Length of forewing 3.0-3.4 mm, of body 3.5-4.0 mm.

*Head*.—Antenna with 40-42 flagellomeres, strongly dilated medially, tapered at apex, medial segments slightly broader than long, apical segments about as long as broad. Temple constricted behind eyes, slightly longer than length of eyes in dorsal view. Occiput deeply concave. Ocelli small,  $OO=3.5OD$ , on line. Frons moderately depressed, finely punctate, with distinct medial carina. Eyes slightly protuberant, glabrous without distinct setae. Gena long and straight in face view. Face slightly protuberant, about 1.5 times as broad as high, areolate-rugose. Clypeus protuberant, punctate, distinctly divided from face; apical border slightly impressed laterally, produced medially into stout dentate flange.

*Mesonotum*.—Pronotum projecting in front of mesonotum, dorsolaterally areolate-rugose. Notauli indistinguishable; mesonotum strongly areolate-rugose. Mesopleuron completely rugose so that precoxal suture not distinct. Propodeum strongly areolate-rugose, with a medial transverse carina raised into a pair of medial stout dentate and a pair of lateral less stout dentate. Hind coxa strigate. Vein r of forewing 1.0-1.5 times as long as 3-RS.

*Metasoma*.—Carapace shorter,  $CL/CW = 1.5-1.7$ , somewhat pointed in dorsal view, rounded and deep in lateral view, areolate-rugose. Ventral opening of carapace short, distinct in front of apex. Hypopygium short. Ovipositor sheath clavate.

*Color*.—Black; carapace yellow at base; all legs yellow except hind femur and tibia black at apex.

*Male*.—Unknown.

*Holotype Female*.—FUJIAN PROVINCE: Huanggangshan, VII-14-85, Y. Q. Tang. Deposited in FAC.

*Paratypes*.—FUJIAN PROVINCE: 1 female, same as holotype; 6 females, Tongmuguan

(Wuyishan), VII-11-82, J. C. Huang; 1 female, Wuyishan, VI-80, H. F. Chao; 2 females, Shanguan (Wuyishan), VII-5-85, D. H. Huang and G. Zheng; 1 female, Wuyishan, VII-15-86, J. S. Wang. GUANGXI PROVINCE: 1 female, Tainlin, V-30-82, J. H. He; 1 female, Longsheng, VI-24-84, J. H. He. ZHEJIANG PROVINCE: 5 females, Songyang, VII-15-89, J. H. He and H. L. Chen; 1 female, Tianmushan, VI-17-83, Y. Ma. ANHUI PROVINCE: 1 female, Huangshan, VII-30-86, S. C. Zhang. JILING PROVINCE: 1 female, Dongliao, VII-20-31-88, X. M. Luo. Deposited in FAC, USNM, ZAU.

*Host*.—Unknown.

*Distribution*.—China (Jiling Province, Anhui Province, Zhejiang Province, Guangxi Province, Fujian Province).

*Remarks*.—This species is close to *quadridentata* from which it can be easily distinguished by its longer antenna, straight and long gena, and yellow hind coxa.

*Etymology*.—This species is named for Prof. H. F. Chao, Fujian Agricultural College, in appreciation for his outstanding contribution to the taxonomy of parasitic Hymenoptera in China.

***Ascogaster consobrina* Curtis**

Figs. 20, 27

*Ascogaster consobrinus* Curtis 1837: 672. Holotype male, GREAT BRITAIN: England. Shenefelt 1973: 819; Huddleston 1984: 367; Papp 1989: 297.

*Diagnosis*.—Antenna with 32-34 flagellomeres, slightly dilated medially (female); ocellar triangle obtuse, ocelli almost on line; face (Fig. 20) about 1.5 times as broad as high, areolate-punctate, hairs downwards; apical border of clypeus not retracted, medially produced into a broad, blunt point, without impression or tubercle; notauli distinct, foveolate, rest of mesonotum punctate except with a broad areolate-rugose area posteromedially; precoxal suture distinct foveolate, mesopleuron (Fig. 27) dorsally finely rugose-punctate except for a polished and impunctate area just dorsal precoxal suture, ventrally always sparsely punctate, shining; carapace rather long, clavate, widest in posterior third, with a downwardly directed anterior flange; hind coxa punctate, sometimes weakly rugose dorsally; hind leg yellow except coxa at base black, apex of femur and sometimes of tarsus infusate. Length of forewing 3.3-3.6 mm, of body 3.8-4.3 mm.

*Specimens Examined.*—ZHEJIANG PROVINCE: 1 female. TAIWAN: 89 females, 12 males.

*Additional Specimens Examined.*—Western European countries, 6 females, 10 males, det. by Huddleston, 1983.

*Hosts.*—No reared material was examined. Shenefelt (1973) recorded *Chelonia caja* and *Gelechia vulgella* as its hosts, but these records need to be confirmed.

*Distribution.*—China (Zhejiang Province), Taiwan., Japan, Korea, and several European countries (see Huddleston 1984: 367)

*Remarks.*—All specimens examined agree well with the redescription given by Huddleston (1984) except for the slightly shorter medial flagellar segments of the female, which are generally about as long as broad.

***Ascogaster dimorpha* Tang and Marsh,  
new species**

Fig. 4

*Female.* Length of forewing 3.8 mm, of body 4.4 mm.

*Head.* Antenna, with 26 flagellomeres, flagellum slightly dilated medially, all segments longer than broad. Temple more or less rounded behind eyes, slightly longer than eye in dorsal view. Occiput strongly concave. Ocelli large, OO = 4.5 OD; ocellar triangle acute, ocelli not on line. Frons behind antenna moderately excavated, smooth anteriorly, rugose-punctate posteriorly. Eyes moderately protuberant, nearly glabrous with only few scattered minute setae. Gena contracted below in face view. Face (Fig. 4) slightly protuberant, about twice as broad as high, densely and regularly rugose-punctate, moderately hairy, the hairs on the upper part of the face pointing upwards. Clypeus moderately protuberant, rugose-punctate, but less densely than that of face, its apical border strongly incised medially.

*Mesosoma.*—Pronotum projecting in front of mesonotum, rugose-foveolate dorsolaterally. Notauli not very distinct, mesonotum finely punctate except with an areolate-rugose area posteromedially. Precoxal suture shallow foveolate, rest of mesopleuron punctate. Propodeum slightly impressed and punctate medially, strongly areolate-rugose laterally, but without distinct tubercles. Hind coxa smooth and shining. Vein r of forewing about 2.5 times as long

as 3-RS.

*Metasoma.*—Carapace long, CL/CW = 2.2, areolate-rugose, but finely and sparsely punctate apically, with a distinct dorsal prominence at base. Hypopygium large and broad. Ovipositor long slender, upcurved.

*Color.*—Black; legs yellow-brown except hind coxa at base and tarsis black, and hind tibia infusate with a pale-yellow band medially; carapace with yellow-pale spots at anterolateral sides; papli yellow-pale,

*Males.*—Same as female except antenna longer, not dilated medially, with 30-31 flagellomeres and carapace more slender, CL/CW = 2.3-2.5, more rounded and deeper apically, without a dorsal prominence at base. Length of forewing 3.6-3.9 mm, of body 4.3-4.5 mm.

*Holotype Female.*—ZHEJIANG PROVINCE: Songyang, VII-18-31-89, J. H. He. Deposited in ZAU..

*Paratypes.*—ZHEJIANG PROVINCE: 3 males, Songyang, VII-15-17-89, J. H. He. TAIWAN: 5 males, Meifeng 2150 m, -24-26-81, K. S. Lin and W. S. Tang (TARI); 1 male, Meifeng, VI-22-26-83, K. S. Lin and S. C. Lin. Deposited in TARI, ZAU.

*Hosts.*—Unknown.

*Distribution.*—China (Zhejiang Province), Taiwan.

*Remarks.*—This species belongs to the *caucasica*-group (*sensu* Huddleston 1984) by virtue of its punctate face, hair on the upper part of the face pointing upwards and the bidentate clypeus. It appears to be related to *caucasica* Kokujev and *bicarinata* Herrich-Schaffer, but is easily distinguished from the later two species by the characteristics of the carapace.

*Etymology.*—The specific name refers to the sexual dimorphism of the metasomal carapace.

***Ascogaster formosensis* Sonan**

Fig. 5

*Ascogaster formosensis* Sonan 1932:78. Holotype female, TAIWAN: Arisan, Kunkiko. Watanabe 1937:76; Shenefelt 1973: 822; Chou 1981: 72 (notes on the locality of types); Papp 1989: 297.

*Ascogaster formosanus* (!): Watanabe 1934: 198.

*Ascogaster longicornis* Huddleston 1984: 368. Holotype female, JAPAN: Mt. Tachibana (ELKU). New synonymy.

*Diagnosis.*—Antenna with 45-49 flagellomeres, medial segment weakly dilated; ocelli on line or

almost on line; face (Fig. 5) rugose-punctate, 1.2-1.5 times as broad as high; clypeus with its apical border rounded except its medial 1/4 weakly emarginate; notauli foveolate, rest of mesonotum densely punctate except posteromedially areolate-rugose; mesopleuron coarsely rugose so that precoxal suture not distinct; propodeum areolate-rugose with 4 prominent tubercles; hind coxa finely punctate; carapace always yellow at base, oval in dorsal view, clavate in lateral view, ventral opening of carapace distinctly in front of apex. Larger species, length of forewing 5.0-5.4 mm, of body 5.8-6.4 mm.

*Specimens Examined*.—YUNNAN PROVINCE: 1 female. TAIWAN: 15 females, 7 males.

*Additional Specimens Examined*.—NEPAL: 1 female, 1 male. INDIA: 6 females, 6 males. JAPAN: Holotype of *longicorinis* Huddleston.

*Hosts*.—Unknown.

*Distribution*.—China (Yunnan Province), Taiwan, India, Japan, Nepal.

*Remarks*.—This species is easily distinguished from other species of Chinese *Ascogaster* by its conspicuously long antennae and by the characteristics of its face and clypeus. It is very similar to *philippinensis* Baker from which it differs only in the sculpture of the mesonotum. We treat it here as a valid species given no intermediate forms are known.

### *Ascogaster fullawayi* (Baker)

Figs. 7, 24

*Cascogaster fullawayi* Baker 1926: 483. Holotype female (cited as male), PHILIPPINES: Baguio, Benguet.

*Ascogaster fullawayi*: Shenefelt 1973: 822.

*Diagnosis*.—Antenna with 34-35 flagellomeres, slightly dilated medially; scrobes outwardly margined by high, thin and complete carina middle of which is raised into sharply angulate teeth; ocelli almost on line; face (Fig. 7) narrow, less 1.5 times as broad as long, strongly and coarsely rugose; clypeus smooth and shining, sparsely punctate, apical border acute; mesonotum between notauli swollen, strongly areolate-rugose; mesopleuron coarsely areolate-rugose, precoxal suture indistinguishable; hind coxa rugose-punctate; carapace (Fig. 24) acute with a tubercle at apex; ventral opening of carapace short, distinctly in front of apex.

*Specimens Examined*.—TAIWAN: 2 females.

*Additional Specimens Examined*.—Holotype of *fullawayi* (Baker), female, PHILIPPINES: Baguio, Benguet (USNM). Holotype of *fullawayi* var. *maquilingensis* (Baker), female, PHILIPPINES: Mt. Makiling, Luzon (USNM). Paratype of *fullawayi* (Baker), 1 female, PHILIPPINES: Imugin, N, Viscaya (USNM).

*Hosts*.—Unknown.

*Distribution*.—Taiwan, Philippines.

*Remarks*.—Two Taiwanese specimens examined agree well with the type of *fullawayi* (Baker) except that the antennae are shorter. This species is the only Philippine *Ascogaster* described by Baker (1926) found in China. It is distinguished from the other Chinese *Ascogaster* by the characteristics of the carapace and sculpture of the head.

### *Ascogaster gibbosa* Tang and Marsh, new species

Fig. 28

*Females*.—Length of forewing 3.0-3.2 mm, of body 3.5-3.8 mm.

*Head*.—Antenna with 37-40 flagellomeres, slightly dilated medially, medial segments about as long as broad. Temple rounded behind eye, slightly shorter than eye in dorsal view. Occiput concave. Ocelli small, OO = 3.5-4.0 OD, on line. Frons moderately depressed, smooth, with a weak medial carina. Eyes protuberant, without distinct setae. Gena in face view contracted. Face about 1.5 times as broad as high, coarsely areolate-rugose. Clypeus distinctly divided from face, punctate, apical border produced medially into a strongly pointed large tooth.

*Mesosoma*.—Pronotum slightly projecting in front of mesonotum, dorsolaterally areolate-rugose. Notauli present, areolate-rugose; mesonotum (Fig. 28) between notauli strongly protuberant, rugose-punctate, rest of mesonotum areolate-rugose. Precoxal suture indistinguishable; mesopleuron completely areolate-rugose. Propodeum strongly areolate-rugose, divided by transverse carina which is raised medially and laterally into prominent dentate flanges. Hind coxa dorsally strigate. Vein r of forewing about as long as 3-RS.

*Metasoma*.—Carapace moderately long, CL/CW = 1.6-1.7, oval in dorsal view, somewhat pointed in lateral view. Hypopygium short.

Ovipositor short, straight.

*Color*.—Almost completely black except extreme apex of hind coxa and of femur yellow.

*Male*.—Unknown.

*Holotype Female*.—TAIWAN: Tsuifeng, VI-3-80, L. Y. Chou and C. C. Chen. Deposited in TARI.

*Paratypes*.—TAIWAN: 2 females, same as holotype; 2 females, Tsuifeng, VII-16-82. S. C. Lin and C. N. Lin; 1 female, Tsuifeng, VI-21-79, K. S. Lin and B. H. Chen; 1 female, Meifeng, VII-31-IX-2-82, L. Y. Chou and K. C. Chou; 1 female, Tayuling, IX-12-15-80, K. S. Lin and C. H. Wang. Deposited in TARI, USNM.

*Host*.—Unknown.

*Distribution*.—Taiwan.

*Remarks*.—This species can be easily distinguished from other species of the *quadridentata*-group (see Huddleston 1984:371) by the characteristics of the mesonotum and by the strongly pointed clypeus tooth and completely black body.

*Etymology*.—The specific name is from the Latin *gibbosus* meaning hunched or humped in reference to the strongly humped mesonotum.

***Ascogaster grandis* Tang and Marsh,**  
new species  
Fig. 6, 21

*Females*.—Length of forewing 4.0-4.1 mm, of body 4.8-5.0 mm.

*Head*.—Antenna with 37 flagellomeres; flagellum dilated medially, strongly tapered at apex, medial segments about as long as broad. Temple slightly constricted behind eyes, at least 1.5 times as long as eye in dorsal view. Occiput deep, concave. Ocelli very small, on line,  $OO = 4.0 OD$ . Frons strongly depressed, rugose-punctate. Eyes protuberant, glabrous, without distinct setae. Gena swollen in lateral view. Face (Fig. 6) slightly protuberant, about 1.5 times as broad as high, areolate-rugose, with medial carina dorsally. Clypeus slightly protuberant, punctate, distinctly divided from face, apical border impressed laterally, produced medially into a very small pointed tooth.

*Mesosoma*.—Pronotum strongly projecting in front of mesonotum, dorsolaterally rugose-punctate, smooth ventrally. Notauli not distinct, mesonotum strongly areolate-rugose. Precoxal suture indistinguishable, mesopleuron strongly areolate-rugose. Propodeum completely coarsely areolate-rugose, divided by a transverse carina

produced into medial and postero-lateral pairs of stout teeth. Hind coxa strongly strigate or areolate-rugose. Vein *r* of forewing about as long as 3-RS.

*Metasoma*.—Carapace (Fig. 21) very long,  $CL/CW = 2.3-2.5$ , areolate-rugose. Ventral opening of carapace very short, ending almost in middle of carapace. Ovipositor concealed.

*Color*.—Black; fore and middle legs yellow except coxae and femora black basally, hind leg black except trochanters reddish-brown; papli pale yellow.

*Male*.—Same as female except antenna not dilated medially.

*Holotype Female*.—ZHEJIANG PROVINCE: Xitianmushan, VII-29-84, X. J. Wu. Deposited in ZAU.

*Paratypes*.—ZHEJIANG PROVINCE: 1 male, same as holotype; 1 female, Xitianmushan, VII-27-84, X. J. Wu; 1 female, Xitianmushan, VII-22-87, X. M. Lou. Deposited in USNM, ZAU.

*Host*.—Unknown.

*Distribution*.—China (Zhejiang Province).

*Remarks*.—Both this species and *macrogaster*, new species, run into the *quadridentata*-group in the key of Huddleston (1984), but both of them are distinguished from species of this group by the characteristics of head shape and their elongate carapaces.

*Etymology*.—The specific name is from the Latin *grandis* meaning large in reference to the large expanded temple.

***Ascogaster hei* Tang and Marsh, new species**  
Figs. 15, 16

*Females*.—Length of forewing 4.0-4.2 mm, of body 4.6-5.0 mm.

*Head*.—Antenna with 33-37 flagellomeres, moderately dilated medially, medial flagellomeres slightly broader than long. Temple rounded behind eyes, distinctly longer than length of eye in dorsal view. Occiput deeply concave. Ocelli small,  $OO = 3.5-4.0 OD$ , almost on line. Frons (Fig. 15) moderately depressed behind antennae, rugose-punctate, with a weak medial carina. Eyes protuberant, nearly glabrous but with a few scattered setae. Gena in face view contracted. Face (Fig. 16) about twice as broad as high, strongly areolate-rugose. Clypeus distinctly divided from face, punctate; apical border produced medially into a small

pointed tooth.

*Mesosoma*.—Pronotum projecting in front of mesonotum, dorsolaterally areolate-rugose. Notauli not distinct; mesonotum strongly areolate-rugose; precoxal suture indistinguishable; mesopleuron coarsely areolate-rugose. Propodeum strongly areolate-rugose, divided by a transverse carina which is raised medially and laterally into stout dentate flanges. Hind coxa strongly strigate. Vein r of forewing about as long as 3-RS.

*Metasoma*.—Carapace longer, CL/CW = 1.6-1.7, clavate in dorsal view. Ventral opening of carapace longer, not very distinctly in front of apex. Hypopygium short. Ovipositor sheaths clavate.

*Color*.—Almost completely black except fore tibia, and sometimes middle and hind coxae testaceous apically.

*Male*.—Same as females except antennae not dilated medially, with 34-35 flagellomeres.

*Holotype Female*.—ZHEJIANG PROVINCE: Fengyangshan, VIII-12-84, L. R. Sheng. Deposited in ZAU.

*Paratypes*.—JILING PROVINCE: 2 females, 3 males, Dongjiang, VII-20-31-88, X. M. Luo. HEILONHJANG PROVINCE: 1 female, Qingdinzhi, V-77, Y. Y. Hun. ZHEJIANG PROVINCE: 1 male, same as holotype; 1 female, Xitainmushan, VIII-3-84, L. K. Sheng; 1 female, Songyang, VII-15-17-89, J. H. He; 1 male, Zhujia, VI-10-85, X. X. Chen. FUJIAN PROVINCE: 1 female, 1 male, Guadun (Wuyishan), VI-11-82, J. H. Xiu; 1 female, Wuyishan, VI-20-80, N. Q. Lin; 1 female, Wuyishan, VI-30-80, J. H. Xiu; 1 female, Wuyishan, VIII-3-83, Y. Ma; 1 male, Wuyishan, VII-30-81, J. S. Weng. Deposited in FAC, USNM, ZAU.

*Host*.—Unknown.

*Distribution*.—China (Heilongjiang Province, Jiling Province, Zhejiang Province, Fujian Province).

*Remarks*.—This species can be distinguished from other species of the *quadridentata*-group by the more massive head, strongly strigate-rugose hind coxa, and larger and stout body.

*Etymology*.—This species is named for Prof. J. H. He, Zhejiang Agricultural University, in appreciation for his helpfulness in this work.

### *Ascogaster lini* Tang and Marsh, new species Fig. 9

*Females*.—Length of forewing 3.9-4.3 mm, of body 4.4-4.8 mm.

*Head*.—Antenna with 33-36 flagellomeres, weakly dilated medially, slightly tapered at apex, medial segments about as broad as long, basal segments distinctly longer than broad, apical segments slightly longer than broad. Temple strongly constricted behind eyes, slightly shorter than eye in dorsal view. Occiput deeply concave. Ocelli small, on line, OO = 4.0 OD. Frons with two depressed, polished impunctate areas behind antenna, median carina distinct. Eyes moderately protuberant, glabrous. Face (Fig. 9) slightly protuberant, about 1.5 times as broad as high, finely punctate, with a median carina in upper part; Clypeus weakly divided from face, protuberant, sparsely punctate, smoother than face; apical border of clypeus strongly impressed laterally, medial area raised and produced forwards into a distinct pointed tooth.

*Mesosoma*.—Pronotum projecting in front of mesonotum, laterally shining and smooth, dorsally rugose-foveolate. Notauli strong, foveolate, coalescing posteriorly in an areolate-rugose area; rest of mesonotum rugose-punctate. Precoxal suture shallow, foveolate; mesopleuron above precoxal suture rugose-foveolate anteriorly, smooth and punctate posteriorly, rest of mesopleuron ventrally densely punctate. Propodeum completely areolate-rugose divided medially by a transverse carina with medial and lateral tubercles, the medial pair broad and stout, lateral tubercles more prominent. Hind coxa finely punctate. Vein r of forewing about 1.5-2.0 times as long as 3-RS.

*Metasoma*.—Carapace long, CL/CW = 1.8-2.0, clavate in dorsal view, finely areolate-rugose, with two weak medial carinae at base. Ventral opening of carapace longer, almost at apex of carapace. Hypopygium short. Ovipositor sheaths clavate, short.

*Color*.—Black except carapace yellow at base; antenna infusate except scape yellow; legs yellow except hind coxa at base, mid and hind femur at apex, and all tarsi infusate.

*Males*.—Same as females except medial flagellomeres not dilated, carapace completely black and scape infusate as in flagellum.

*Holotype Female*.—TAIWAN: Tsuifeng 2300m, malaise trap, VI-84, K. S. Lin and K. C. Chou. Deposited in TARI.

*Paratypes*. TAIWAN: 1 female, 3 males, Tsuifeng, VI-21-79, K. S. Lin and B. H. Chen; 3 males, Tsuifeng, VI-3-80, L. Y. Chou and C. C. Chen; 1 male, Tsuifeng, V-8-81, K. S. Lin and S. C. Lin; 1 female, Tsuifeng, VII-1-3-81, T. Lin and W. S. Tang; 12 females, 4 males, VI-25-27-81, K. S. Lin and W. S. Tang; 2 females, 1 male, Tsuifeng, V-23-82, L. Y. Chou; 9 females, 1 male, VII-16-82, S. C. Lin and C. N. Lin; 4 females, 5 males, Tsuifeng, VI-23-25-83, K. S. Lin and S. C. Lin; 13 females, 14 male, same as holotype; 20 females, 8 males, Tsuifeng, VII-XI-84, Malaise trap, K. S. Lin and K. C. Chou; 1 male, Tsuifeng, IX-85, Malaise trap, K. S. Lin; 1 female, 1 male, Meifeng, V-10-79, K. C. Chou; 2 females, Meifeng, VI-20-22-79, K. S. Lin and B. H. Chen; 2 females, 1 male, Meifeng, VI-2-4-80, L. Y. Chou and C. C. Chen; 1 female, Meifeng, VI-5-8-80, C. C. Chen; 1 female, Meifeng, VI-8-80, K. S. Lin and B. H. Chen; 1 female, Meifeng, X-5-9-80, C. C. Chen and C. C. Chien; 1 female, 10 males, Meifeng, V-7-9-81, K. S. Lin and S. C. Lin; 2 females, Meifeng, VI-24-26-81, K. S. Lin and W. S. Tang; 2 males, Meifeng, V-22-82, L. Y. Chou; 1 male, Meifeng, V-3-83, H. Townes; 5 males, Meifeng, V-10-83, H. Townes; 2 males, Meifeng, V-15-83, H. Townes; 1 female, 4 males, V-22-83, H. Townes; 4 females, Meifeng, VI-22-26-83, K. S. Lin and S. C. Lin; 1 male, Meifeng, V-8-11-84, K. C. Chou and C. C. Pan; 1 female, 3 males, Meifeng, VI-84, Malaise trap, K. S. Lin and K. C. Chou; 1 female, Meifeng, VIII-84, Malaise trap, K. S. Lin and K. C. Chou; 1 female, Meifeng, X-84, Malaise trap, K. S. Lin and K. C. Chou; 1 female, Meifeng, X-85, Malaise trap, K. S. Lin; 1 female, Sungkang 2100 m, X-84, Malaise trap, K. S. Lin and K. C. Chou; 1 female, 2 males, Sungkang, X-XI-85, Malaise trap, K. S. Lin; 8 females, 3 males, Tayuling 2560 m, VI-9-16-80, Malaise trap, K. S. Lin and B. H. Chen; 1 female, 2 males, Alishan 2400 m, VI-12-16-65, T. Maa and K. S. Lin; 4 females, Anmashan 2275m, VII-6-9-79, L. Y. Chou. Deposited in AEIG, FAC, TARI, USNM.

*Host*.—Unknown.

*Distribution*.—Taiwan.

*Remarks*.—This species is very similar to *perkinsi* in the characteristics of the face and clypeus, but it is rather different in the shape of the carapace and color patterns of both legs and antennae.

*Etymology*.—It is a pleasure to name this species in honor of its collector, Mr. K. S. Lin, who also collected a large amount of Braconidae in Taiwan.

***Ascogaster macrogaster* Tang and Marsh,  
new species**

*Females*.—Length of forewing 3.5-4.2 mm, of body 4.3-4.9 mm.

*Head*.—Antenna with 33 flagellomeres, slightly dilated medially, medial segments about as long as broad. Temple slightly contracted behind eyes, slightly longer than eyes in dorsal view. Occiput concave. Ocelli larger,  $OO = 3.0OD$ , on line. Frons slightly excavated, rugose-punctate; medial carina distinct. Eyes not protuberant, glabrous without distinct setae. Gena expanded in lateral view. Face slightly protuberant, about 1.5 times as broad as high, areolate-rugose. Clypeus punctate; apical border impressed laterally, produced medially into a small pointed tooth.

*Mesosoma*.—Pronotum strongly projecting in front of mesonotum, dorsolaterally areolate-rugose. Notauli not distinct; mesonotum rugose-punctate anteriorly, rest of mesonotum foveate. Mesopleuron deep punctate, but precoxal suture not distinguishable. Propodeum strongly areolate-rugose, not distinctly divided into dorsal and posterolateral surfaces. Hind coxa smooth, shining. Vein r of forewing about 1.5 times as long as 3-RS.

*Metasoma*.—Carapace very long,  $CL/CW = 2.5$ , areolate-rugose, rounded apically in lateral view. Ventral opening of carapace at  $1/4$  apex of carapace. Hypopygium broad. Ovipositor short, pointed apically; ovipositor sheath clavate.

*Color*.—Black; carapace sometimes yellow at base; all legs yellow except hind femur and tibia brownish apically; palpi pale yellow.

*Male*.—Same as female except antenna not dilated medially, all flagellomeres longer than broad, and smaller yellow spot at basal carapace.

*Holotype Female*.—FUJIAN PROVINCE: Tongmugun (Wuyishan), VI-23-82, J. C. Huang. Deposited in FAC.

*Paratypes*.—FUJIAN PROVINCE: 1 female, same as holotype; 1 female, Wuyishan, VI-80, H. F. Chao; 1 female, Wuyishan, VI-80, J. C. Huang; 1 male, Huanxi, V-30-86, N. Q. Lin. Deposited in FAC.

*Host*.—Unknown.

*Distribution*.—China (Fujian Province).

*Remarks.*—This species is very close to *grandis* from which it can be distinguished not only by the characters mentioned in the key but also by the lack of distinct tubercles on the propeodum.

*Etymology.*—The specific name is from the Greek makros meaning long and gaster meaning stomach in reference to the long metasomal carapace.

### *Ascogaster perkinsi* Huddleston

Figs. 10, 22

*Ascogaster perkinsi* Huddleston 1984: 368. Holotype female, JAPAN: Mt. Tachibana, Fukuoka.

*Diagnosis.*—Length of forewing 2.6–2.9 mm, of body 3.0–3.5 mm. Antenna with 34–36 flagellomeres, slightly dilated medially (female); ocellar triangle obtuse, ocelli almost on line; face (Fig. 10) about 1.5 times as broad as high, rugose-punctate; apical border of clypeus strongly impressed laterally, medial area projecting and produced forwards into a distinct pointed tooth; notauli weak, foveolate, rest mesonotum rugose-punctate; precoxal suture foveolate, mesopleuron above precoxal suture areolate-foveolate anteriorly, sparsely punctate posteriorly, rest of mesopleuron densely punctate; carapace short, oval in dorsal view, clavate in lateral view, generally yellow at base; ventral opening of carapace (Fig. 22) short, distinctly in front of apex; hind coxa finely punctate; all legs yellow except middle tibia dark at base, hind femur and tibia dark at base, mid and hind tarsi infuscate.

*Specimens Examined.*—ZHEJIANG PROVINCE: 41 females, 24 males. HUNAN PROVINCE: 1 male. FUJIAN PROVINCE: 4 females, 3 males. TAIWAN: 11 females, 6 males.

*Host.*—Unknown.

*Distribution.*—China (Zhejiang Province, Hunan Province, Fujian Province), Taiwan, Japan.

*Remarks.*—All specimens examined agree well with the description of Huddleston (1984). This is a new species record for the fauna of China.

### *Ascogaster quadridentata* Wesmael

Figs. 17, 18

*Ascogaster quadridentatus* Wesmael 1835: 237. Lectotype female, BELGIUM: Brussels (designated by Shaw 1983).

*Chelonus impressus* Herrich-Schäffer 1838: 153. Syntypes, GERMANY (syn. by Reinhard 1867)

*Ascogaster nigricornis* Thomson 1892: 1719. Lectotype female, SWEDEN (designated and syn. by Huddleston 1984). Shenefelt 1973: 826.

*Ascogaster cynipum* Thomson 1892: 1720. Holotype male, SWEDEN (syn. by Huddleston 1984). Shenefelt, 1973: 820.

*Ascogaster egregius* Kokujev 1895: 83. Holotype male, USSR (syn. by Huddleston 1984). Fahringer 1934: 525; Shenefelt 1973: 821.

*Chelonus nigrator* Szépligeti 1896: 303. Holotype female, YUGOSLAVIA: Buccari (syn. by Huddleston 1984). Shenefelt 1973: 859.

*Chelonus carpocapsae* Viereck 1909: 43. Holotype female, USA: Michigan (syn. by Rosenberg 1934).

*Ascogaster epinotiae* Watanabe, 1937: 76. Holotype female, JAPAN: Hokkaido, Sapporo (syn. by Huddleston 1984). Shenefelt 1973: 821.

*Ascogaster quadridentata*; Shenefelt 1973: 828; Shaw 1983: 32; Huddleston 1984: 376 Walker and Huddleston 1987: 343; Papp 1989: 258.

*Diagnosis.*—Antenna with 27–32 flagellomeres, slightly dilated medially; ocelli on line or almost on line (Fig. 17); face (Fig. 18) about twice as broad as high, generally finely rugose; clypeus finely punctate, apical border produced medially into a pointed tooth; notauli and precoxal suture indistinguishable, mesonotum and mesopleuron completely areolate-rugose; hind coxa always mostly black and strongly strigate-rugose; carapace oval, short, generally deep in lateral view, sometimes yellow at base; ventral opening of carapace short, usually distinctly in front of apex.

*Specimens Examined.*—BEIJING CITY: 1, female, 1 male. JILING PROVINCE: 1 male. HUNAN PROVINCE: 2 females. JIANGXI PROVINCE: 1 male. GUANGXI PROVINCE: 1 female, 1 male. YUNNAN PROVINCE: 2 females, 2 males. GUIZHOU PROVINCE: 3 females, 2 males. ZHEJIANG PROVINCE: 29 females, 30 males. FUJIAN PROVINCE: 18 females, 11, males. TAIWAN: 26 females, 7 males.

*Additional Specimens Examined.*—Lectotype of *quadridentatus* Wesmael, female, BELGIUM: Brussels (IRSNB). Lectoparatypes of *quadridentatus* Wesmael, 1 female, 5 males, same as lectotype (IRSNB). USA: 1 female, 1 male, WA, Pullman, August 30, 1989, ex. *Cydia pomonella*, det. by Shaw, 1990 (FAC).

*Hosts.*—Huddleston (1984) and Shaw (1983) recorded the following hosts in the Palearctic and Nearctic Regions: *Cydia fumebrana* (Treitsche), *Cydia nigricana* Steph., *Cydia pallifrontana* (Lienig & Zeller), *Cydia pomonella* (L.), *Epiblema uddmanniana*

(L.), *Grapholitha molesta* (Busck), *Grapholitha prunivora* (Walsh), *Spilonota ocellana* (Denis & Schiffermuller) (Lepidoptera: Tortricidae); *Endopiza viteana* (Clem.); *Yponomeuta padella* (L.) (Lepidoptera: Yponomeutidae).

*Distribution*.—China (Beijing City, Jiling Province, Jiangsu Province, Zhejiang Province, Yunnan Province, Guizhou Province, Guangxi Province, Fujian Province), Taiwan, Japan, Korea, New Zealand, West Palaearctic Region, Nearctic Region.

*Remarks*.—This species has been studied widely as a parasitoid of several economically important insect pests in Europe and North America. Its hosts and biology were reviewed by Huddleston (1984) and Shaw (1983). There is very little published work on this species in China. Fahringer (1934) recorded it in Jiangsu Province (=Kiangfu). This species is characterized by its coarse sculpture, short oval and deep carapace, short temple and antenna, highly strigate and black hind coxa, and the single tooth on its clypeus.

#### *Ascogaster reticulata* Watanabe

*Ascogaster reticulatus* Watanabe 1967: 41. Holotype male (cited as female), JAPAN: Hokkaido, Ashigawa. He, Chen and Ma 1989: 438.

*Ascogaster reticulata*: Huddleston 1984: 377; Papp 1989: 298.

*Diagnosis*.—Length of forewing 2.8-3.2 mm, of body 3.4-3.8 mm. Antenna with 34-36 flagellomeres, weakly dilated medially; ocelli large, on line; face about 1.5 times as broad as high, coarsely irregularly rugose; clypeus strongly punctate, matt and its apical border almost flat without any trace of tooth or tubercle; mesonotum areolate-rugose, notauli indistinct; precoxal suture indistinguishable, mesopleuron strongly areolate-rugose; carapace short, deep, sometimes yellow at base; ventral opening of carapace short, distinctly in front of apex; hind coxa yellow, smooth or sometimes finely punctate; hind tibia black with a pale yellow medial band.

*Specimens Examined*.—BEIJING CITY: 2 females. HENAN PROVINCE: 13 females. SHANDONG PROVINCE: 8 females, 5 males. SHANXI PROVINCE: 8 females. SHAANXI PROVINCE: 3 females, 1 male. ANHUI PROVINCE: 1 male. JIANGSHU PROVINCE: 9 females, 2 males. JIANGXI PROVINCE: 2 females. ZHEJIANG PROVINCE: 7 females, 4 males.

YUNNAN PROVINCE: 3 females. GUANHXI PROVINCE: 1 female. FUJIAN PROVINCE: 1 female, 1 male. TAIWAN: 31 females, 36 males.

*Additional Specimens Examined*.—Holotype of *reticulatus* Watanabe, male, JAPAN: Hokkaido, Asahigawa, June 15, 1966 (UEI). Paratypes of *reticulatus* Watanabe: 3 females, JAPAN, May 16-July 20, 1966 (UEI); 1 female, 1 male, JAPAN, July 20-23, 1966 (USNM).

*Hosts*.—*Acleris fimbriana* (Thunberg), *Adoxophyes orana* (Fischer von Roslerstamm), *Archips issikii* Kodama, *Archips oporana* (L.), *Archips pulchra* (Butler), *Carposiana nipponensis* Walsingham (Lepidoptera: Tortricidae).

*Distribution*.—China (Beijing City, Henan Province, Shandong Province, Shanxi Province, Shannxi Province, Anhui Province, Jiangsu Province, Jiangxi Province, Zhejiang Province, Yunnan Province, Guangxi Province, Fujian Province), Taiwan, Japan, Korea, Czechoslovakia.

*Remarks*.—This species is easily distinguished from other species of the *quadridentata*-group by the matt and no tooth clypeus and by the yellow and smooth hind coxa and the hind tibia with a yellow-pale band medially.

#### *Ascogaster rugulosa* Tang and Marsh, new species Fig. 13

*Females*.—Length of forewing 3.0-3.2 mm, of body 3.4-3.7 mm.

*Head*.—Antenna with 31-35 flagellomeres, slightly dilated medially, flagellomeres 1-11 longer than broad, rest of flagellum about as broad as long. Temple rounded behind eyes, about equal to length of eye in dorsal view. Occiput concave. Ocelli small, OO=3.5-4.0 OD, on line. Eyes protuberant, glabrous. Frons moderately concave, smooth, with a weak medial carina. Face (Fig. 13) about 1.5 times as broad as high, finely areolate-rugose, generally more finely sculptured ventrally than dorsally. Clypeus punctate, apical border produced medially into a pointed tooth.

*Mesosoma*.—Pronotum little projecting in front of mesonotum, rugose-punctate dorsolaterally. Notauli present but not very distinct; mesonotum rugose-punctate except an areolate-rugose area posteromedially. Precoxal suture very weak, shallow foveolate; rest of mesopleuron sparsely but coarsely punctate. Propodeum coarsely areolate-

rugose, divided by a tranverse carina which is raised into a pair of medial dentate flanges and a pair of lateral dentate flanges. Hind coxa finely punctate. Vein r of forewing about as long as or slightly longer than 3-RS.

*Metasoma*.—Carapace short, oval in dorsal view, clavate in lateral view, areolate-rugose. Ventral opening of carapace less distinctly in front of apex. Ovipositor short, tapered apically.

*Color*.—Black; fore and middle legs yellow except middle tibia at apex and all tarsi infuscate, hind leg black except apex of coxa and base of femur yellow and with a pale yellow medial band on tibia; carapace always yellow laterally at base, but black medially.

*Males*.—Same as females except antenna not dilated medially.

*Holotype Female*.—TAIWAN: Meifeng, V-7-9-81, K. S. Lin and S. C. Lin. Deposited in TARI.

*Paratypes*.—ZHEJIANG PROVINCE: 1 male, Xitainmushan, VI-2-4-90, L. G. Weng. HAINAN PROVINCE: 1 male, Shuiman, V-26-60, X. F. Li. TAIWAN: 7 females, 1 male, same as holotype; 1 female, Meifeng, VII-26-78, K. C. Chou; 1 female, Meifeng, IV-8-9-78, K. S. Lin; 1 male, Meifeng, VII-18-79, K. C. Chou; 1 female, Meifeng, V-15-22-79; 1 female, Meifeng, VI-20-21-79, K. S. Lin and B. H. Chen; 1 female, Meifeng, X-5-9-80, C. C. Chen and C. C. Chien; 1 male, Meifeng, VI-24-26-81, K. S. Lin and W. S. Tang; 3 males, Meifeng, VIII-28-29-81, L. Y. Chou and S. C. Lin; 1 female, 1 male, VII-31-IX-2-82, L. Y. Chou and S. C. Lin; 2 females, 2 males, Meifeng, V-8-11-82, K. C. Chou and C. C. Pan; 1 male, Meifeng, VII-30-83, L. Y. Chou; 1 female, Meifeng, VI-22-26-83, K. S. Lin and S. C. Lin; 1 female, Meifeng, X-4-7-82, K. C. Chou; 1 male, V-8-11-84, K. C. Chou and C. C. Pan; 1 female, Meifeng, VII-84, Malaise trap, K. S. Lin and K. C. Chou; 1 female, Tungpu, X-18-21-82, K. C. Chou and S. C. Lin; 1 female, Tungpu, VI-20-24-83, K. C. Chou and C. Y. Wong; 1 female, Tungpu, VII-85, Malaise trap, K. S. Lin; 1 female, Tsuifeng, VI-21-79, K. S. Lin and B. H. Chen; 1 female, Tsuifeng, VI-3-80, L. Y. Chou and C. C. Chen; 1 female, Tsuifeng, V-8-81, K. S. Lin and S. C. Lin; 4 females, 1 male, Tsuifeng, VI-25-27-81, K. S. Lin and W. S. Tang; 1 male, Tsuifeng, VIII-27-81, L. Y. Chou and S. C. Lin; 1 male, Tsuifeng, IX-1-3-82, L. Y. Chou and K. C. Chou; 3 females, Tsuifeng, VI-23-25-83, K. S. Lin and S. C. Lin; 2 females, Tsuifeng, VI-VII-84, Malaise trap, K. S. Lin and K. C. Chou; 3 males,

Tsuifeng, IX-85, Malaise trap, K. S. Lin; 4 males, Tsuifeng, IX-12-14-84, K. S. Lin and S. C. Lin; 3 males, Wushe, IV-26-83, H. Townes; 1 male, Wusha, VII-25-78, K. C. Chou; 1 female, Sungkang, VIII-6-84, K. S. Lin; 1 female, 1 male, Sungkang, X-84, Malaise trap, K. S. Lin and K. C. Chou; 2 males, Sungkang, Malaise trap, IX-X-85, K. S. Lin; 1 female, 2 males, Shengkuang, IX-20-68, K. S. Lin; 1 female, Wuling, VI-27-29-79, K. S. Lin and L. Y. Chou; 1 female, Tayuling, VI-9-16-80, K. S. Lin and B. H. Chen; 1 male, Lishan, IX-12-68, K. C. Chou. Deposited in AEIG, FAC, TARI, USNM, ZAU, ZRI.

*Host*.—Unknown.

*Distribution*.—China (Zhejiang Province, Hainan Province), Taiwan.

*Remarks*.—This species is close to *reticulata* from which it can be distinguished not only by its characters mentioned in the key but also by its smooth mesopleuron, less deep carapace and mostly black hind coxa.

*Etymology*.—The specific name is in reference to the rugulose sculpturing on the clypeus.

#### *Ascogaster semenovi* Telenga

Figs. 11, 25

*Ascogaster semenovi* Telenga 1941: 310, 453. Holotype female, MONGOLIA: Alashan, Dyn-juan-in. Shenefeldt 1973: 825, Huddleston 1984: 352.

*Ascogaster kyushuensis* Yoneda 1978: 291. Holotype female, JAPAN: Kyushu, Fukuoka Pref., Fukuoka City, Hakozaki (syn. by Huddleston 1984).

*Diagnosis*.—Length of forewing 4.3-4.7 mm, of body 5.2-5.6 mm. Antenna of female with 20 flagellomeres and medial segments dilated, generally broader than long, male with 25-26 flagellomeres, medially not dilated, all segments longer than broad; ocellar triangle acute, ocelli not on line; face (Fig. 11) about twice as broad as high, rugose-punctate, the hairs on the upper part of face pointing upwards; clypeus with its apical border rounded medially, produced laterally into broad dentate flanges, without tooth or incision; notauli distinct, foveolate, rest of mesonotum punctate with an areolate-rugose area posteromedially; precoxal suture deep foveolate, rest of mesopleuron punctate with a deep foveolate groove anterodorsally; hind coxa finely and sparsely punctate; carapace (Fig. 25) long, CL/CW = 2.2-2.4, pointed in dorsal and lateral views; ovipositor

sheaths broad, knife-like. Almost completely black except sometimes fore tibia reddish-brown.

*Specimens Examined*.—JIANGSU PROVINCE: 2 females, 6 males. SHANGHAI CITY: 8 females, 3 males. ZHEJIANG PROVINCE: 2 females, 8 males.

*Hosts*.—Unknown.

*Distribution*.—China (Jiangsu Province, Shanghai City, Zhejiang Province), Mongolia, Japan.

*Remarks*. This remarkable species is easily distinguished from other species of *Ascogaster* by the lateral dentate flanges on its clypeus and by the broad and knife-like ovipositor sheaths. It is new to the fauna of China.

*Ascogaster setula* Tang and Marsh, new species  
Fig. 8

*Females*.—Length of forewing 2.4-2.7 mm, of body 2.9-3.1 mm.

*Head*.—Antenna with 26-29 flagellomeres; flagellum moderately dilated medially, medial segments slightly broader than long, apical segments about as broad as long. Temple rounded behind eyes, about equal to or slightly shorter than eye in dorsal view. Occiput concave. Ocelli small, OO = 4.0 OD, almost on line. Frons moderately depressed behind antenna. Eyes slight protuberant, with dense and distinct hairs. Malar space shorter, about 0.5 time as eye high. Gena strongly constricted in face view. Face (Fig. 8) protuberant, coarsely rugose-punctate, about 1.5 times as broad as high. Clypeus not distinctly divided from face, slightly convex, its apical border more or less straight, with a very small tooth medially.

*Mesosoma*.—Pronotum protecting in front of mesonotum, dorsolaterally foveate. Notauli shallow foveolate, rest of mesonotum punctate except an areolate-rugose area posteromedially. Precoxal suture not very distinct, mesopleuron generally coarsely rugose-punctate, sometimes areolate-rugose. Propodeum coarsely areolate-rugose, divided by a transverse carina which is raised into a medial pair and a lateral pair of stout dentate flanges. Hind coxa smooth. Vein r of forewing 1.0-1.3 times as long as 3-RS.

*Metasoma*.—Carapace shorter, CL/CW = 1.5-1.8, areolate-rugose, oval, deeper in lateral view. Ventral opening of carapace distinctly in front of apex. Hypopygium short. Ovipositor short, its sheath clavate.

*Color*.—Black; carapace always yellow at base; all legs yellow except hind femur and tibia apically infusate.

*Males*.—Same as female except antennae not dilated medially and carapace black at base.

*Holotype Female*.—TAIWAN: Tungpu, XI-18-21-82, K. C. Chou and S. C. Lin. Deposited in TARI.

*Paratypes*.—TAIWAN: 4 females, 1 male, same as holotype; 3 females, 2 males, Tungpu, IX-25-29-80, L. Y. Chou and T. Lin; 1 female, Tungpu, IV-28-V-2-81, T. Lin and C. J. Lee; 2 females, 1 male, Tungpu, X-5-8-81, T. Lin and W. S. Tang; 1 female, Tungpu, XI-18-23-81, T. Lin and W. S. Tang; 6 females, Tungpu, X-XI-85, Malaise trap, K. S. Lin; 4 males, Tungpu, IV-16-VII-27-84, K. C. Chou and C. H. Yung; 2 females, 2 males, Lienhuachi, III-VII-84, Malaise trap, K. S. Lin and K. C. Chou. Deposited in FAC, TARI, USNM.

*Hosts*.—Unknown.

*Distribution*.—Taiwan.

*Remarks*.—Previous authors (Baker 1926, Shaw 1983, Zettel 1990) treated glabrous eyes as a character to distinguish *Ascogaster*. Strikingly this species has distinct and dense setae on its eyes, but except for this character it agrees well with typical *Ascogaster*. Its very small body and the characteristics of the clypeus are also useful to distinguish this species from other Chinese *Ascogaster*.

*Etymology*.—The specific name is the diminutive form of the Latin seta meaning bristle in reference to the unusually hairy eyes.

*Ascogaster townesi* Tang and Marsh,  
new species  
Figs. 12, 26

*Females*.—Length of forewing 4.3-4.5 mm, of body 4.6-4.9 mm.

*Head*.—Antenna with 23 flagellomeres, medial segments not dilated, all segments longer than broad. Temple rounded behind eyes, slightly longer than eye in dorsal view. Occiput deeply concave. Ocelli small, OO = 4.0-4.5 OD, ocellar triangle acute, ocelli not on line. Frons behind antenna slightly depressed, sparsely punctate. Eyes moderately protuberant, glabrous with few scattered minute setae. Malar space short. Gena in face view strongly constricted. Face (Fig. 12) slightly convex, about twice as broad as high, less hairy, the hairs on the upper part of face pointing upwards, finely punctate, with a medial carina on the

upper part. Clypeus slightly protuberant, more scatteredly punctate than face; apical border straight, without medial teeth or flanges.

*Mesosoma*.—Pronotum projecting little in front of mesonotum, dorsolaterally smooth, shallow foveate. Notauli deep, foveolate, rest of mesonotum punctate except with a depressed and areolate-rugose area posteromedially. Precoxal suture shallow foveate; rest of mesopleuron sparsely punctate, smooth except anterodorsally foveolate. Propodeum not distinctly divided into dorsal and posterolateral surfaces; strongly rugose with no tubercles. Hind coxa smooth. Vein r of forewing 1.0-1.2 times as long as 3-RS.

*Metasoma*.—Carapace (Fig. 26) very long, CL/CW = 2.3-2.5, clavate in dorsal view, flat in lateral view, areolate-rugose, apically polished. Ventral opening of carapace at apex of carapace. Hypopygium large and broad. Ovipositor long, slender and upcurved.

*Color*.—Black; legs yellow-brown except hind coxa basally, hind and middle femora and tibia apically and tarsi brownish; antenna infusate except scape reddish brown; palpi yellowish brown.

*Males*.—Same as females except antennae longer with 32 flagellomeres, flatter carapace and yellow hind coxa.

*Holotype Female*.—TAIWAN: Meifeng 2150 m, V-10-83, H. Townes. Deposited in AEIG.

*Paratypes*.—TAIWAN: 1 male, Meifeng 2150 m, IV-19-21-83, K. C. Chou and P. Huang; 4 males, Meifeng 2150 m, IV-26-83, H. Townes; 1 female, 30 males, Meifeng 2150 m, V-3-83, H. Townes; 2 females, 17 males, same as holotype. Deposited in AEIG, FAC, TARI, USNM.

*Host*.—Unknown.

*Distribution*.—Taiwan.

*Remarks*.—This species is easily distinguished from other species of *Ascogaster* by the hairs on the upper part of the face, very flat carapace, no tubercle on its clypeus, and long, upcurved ovipositor.

*Etymology*.—It is a pleasure to name this species in honor the late Henry Townes who collected many of the type series and who contributed greatly to our knowledge of the World Ichneumonoidea during his lifetime.

## *Ascogaster varipes* Wesmael

Fig. 14

*Ascogaster varipes* Wesmael 1835: 234. Lectotype female, BELGIUM: Brussels (designated by Huddleston 1984). Shenefelt 1973: 837; Huddleston 1984: 370; Tobias 1986: 305; Papp 1989: 298.

*Ascogaster cavifrons* Thomson 1874: 585. Lectotype female, SWEDEN: Skane, Torekov (designated and syn. by Huddleston 1984). Shenefelt 1973: 818.

*Ascogaster sternalis* Thomson 1874: 587. Lectotype female, SWEDEN: Smaland (designated by Huddleston 1984 and syn. by Telenga 1941).

*Ascogaster jaroslawensis* Kokujev 1895: 86. Holotype female, USSR: 'Jaroslaw' (syn. by Huddleston 1984). Shenefelt 1973: 824; Tobias 1986: 304 (as a valid species).

*Ascogaster variipes*; Telenga 1941: 322.

*Diagnosis*.—Antenna with 32-36 flagellomeres, slightly dilated medially (females); ocellar triangle obtuse, ocelli almost on line; face (Fig. 14) generally rugose-punctate, all hairs downwards; clypeus with its apical border transversely impressed, without medial tooth or excision; mandibles with a deep semicircular depression at base; notauli distinct, foveolate, rest of mesonotum punctate except posteriorly areolate-rugose; mesopleuron coarsely rugose so that precoxal suture not easily distinguished; propodeum completely areolate-rugose; hind coxa strongly transversely strigate; carapace short, oval, deep in lateral view, ventral opening of carapace short, distinctly in front of apex.

*Specimens Examined*.—SHANDONG PROVINCE: 2 females, Lao-shan, 800 m.

*Additional Specimens Examined*.—Lectotype of *varipes* Wesmael, female, BELGIUM: Brussels (IRSNB). Lectotype and paralectotypes of *varipes* Wesmael, BELGIUM: 2 females, 3 males (IRSNB).

*Hosts*.—Shenefelt (1973) listed many host records. However, much of this information is of little value because of doubt about the accuracy of identification of the parasite species involved (see Huddleston 1984).

*Distribution*.—China (Shandong Province), Korea, "USSR" and many other European countries (see Huddleston 1984).

*Remarks*.—This species is characterized on account of the semicircular depression at the base of the mandibles, the strongly strigate hind coxa, the characteristics of the clypeus and the shape of the carapace. The two female Chinese specimens examined here differ from the type series of *varipes*

Wesmael in having a rugose-punctate face instead of a finely areolate-rugose face as in the type series.

*Ascogaster yunnanica* Tang and Marsh, new species

*Male*.—Length of forewing 2.7 mm, of body 3.3 mm.

*Head*.—Antenna incomplete, 1st flagellomere about 3.0 times as long as broad, 2-6th flagellomeres 2.0-2.5 times as long as broad. Temple constricted behind eyes, slightly shorter than eye in dorsal view. Occiput deeply concave. Ocelli small OO = 4.0 OD; ocellar triangle acute, ocelli not on line. Frons behind antenna moderately depressed, smooth. Eyes slightly protuberant, glabrous without distinct setae. Malar space short. Gena in face view strongly constricted. Face slightly convex, finely and sparsely punctate, about twice as broad as high, the hairs on the upper part of face pointing upwards. Clypeus slightly protuberant, more sparsely punctate than face, apical border straight without flange or tooth.

*Mesosoma*.—Pronotum projecting little in front of mesonotum, deep foveate dorsolaterally. Notauli foveolate, coalescing posteriorly in a fine areolate-rugose area; rest of mesonotum punctate. Precoxal suture shallow foveate anterodorsally, indistinct posteroventrally; rest of mesopleuron smooth posteroventrally, punctate anterodorsally. Propodeum not distinctly divided into dorsal and posterolateral surfaces, strongly rugose but with no dentates. Hind coxa smooth. Vein r of forewing about twice as long as 3-RS.

*Metasoma*.—Carapace very long, CL/CW = 2.5, oval in dorsal view, deeper and not so strongly flat in lateral view, areolate-rugose, but sparsely punctate apically. Ventral opening of carapace long, at apex of carapace.

*Color*.—Black; all legs yellow except hind coxa mostly black, hind femur and tibia apically and tarsi infuscate; palpi yellow-brown.

*Female*.—Unknown.

*Holotype Male*.—YUNNAN PROVINCE: Kunming, III-30-81, J. H. He. Deposited in ZAU.

*Host*.—Unknown.

*Distribution*.—China (Yunnan Province).

*Remarks*.—Morphologically this species is similar to *townesi* from which it differs not only in the characters mentioned in the key but also in the smaller body and the less flat carapace.

*Etymology*.—The species name is in reference to the type locality.

ACKNOWLEDGEMENTS

We thank the following people for loan of types and much of unidentified specimens or for providing valuable information: C. van Achterberg (The Netherlands), A. Austin (Australia), H. F. Chao (FAC), X. X. Chen (ZAU), L. Y. Chou (TARI), P. Dessart (IRSNB), J. H. He (ZAU), T. Huddleston (BMNH), K. Maeto (UEI), I. Nauman (Australia), J. Papp (HNHM), D. J. Preston (BM), M. J. Sharkey (CNC), S. R. Shaw (Wyoming), G. N. Shida (BM), M. Suwa (UEI), D. Wahl (AEIG), J. Y. Wang (ZRI). We also thank C. M. Liu (FAC) for help with translations of some Russian papers. The senior author offers special thanks to Prof. H. F. Chao for his continued helpfulness and encouragement and to Chunying for her patience and understanding. This work was partly supported by a grant to Y. Q. Tang by the National Educational Commission of the People's Republic of China.

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Gattungen und Arten. *Annales Naturhistorisches Museum Wien* 91(B): 147-196.

#### NOTE ADDED IN PROOF

The following paper came to our attention after our manuscript was sent to the printer: Chen Jiahua, Huang Juchang and Wu Zhishan. 1994. Notes on two new species and six new records of the genus *Ascogaster* Wesmael from China (Hymenoptera: Braconidae: Cheloniinae). *Journal of the Fujian Agricultural College (Natural Sciences Edition)* 23(1):51-57. Although we were not able to study the specimens used by Chen et al., we have made comments below on each species mentioned by them based on a translated version of their paper.

*Ascogaster albitarsis* Sonan. The characters mentioned in their key are not significant to separate this species from *reticulatus* based on our study (see discussion under *reticulatus*).

*Ascogaster arisanica* Sonan and *Ascogaster bidentula* Wesmael. During our study we examined the type material of *arisanica*, *bidentula* and *atamiensis* (synonym of *bidentula*). All of the material we examined under the name *arisanica* agreed with the type but none agreed with types of *bidentula* or *atamiensis*. Furthermore, we found that the characters used by Chen et al. and Huddleston (1984) are not reliable in distinguishing *bidentula* and *arisanica* (see our discussion of *arisanica*).

Most of the material examined by Chen et al. of *bidentula* and *arisanica* was collected at the same locality and same date; thus we suspect that their material is probably *arisanica*. This problem is further complicated by the fact that *atamiensis* was recorded from China by Fahringer (1938, *Ark. Zool.* 30:3) and Shenefelt (1973). Obviously this species complex needs to be studied further.

*Ascogaster consobrina* Curtis and *Ascogaster infacetus* Chen and Huang. The new species described in Chen et al., *infacetus*, will run to *consobrina* in our key. Fig. 1B in Chen et al. which is an illustration of the mesopleuron is not clear. Thus, we must reserve comment on this species until the type can be observed.

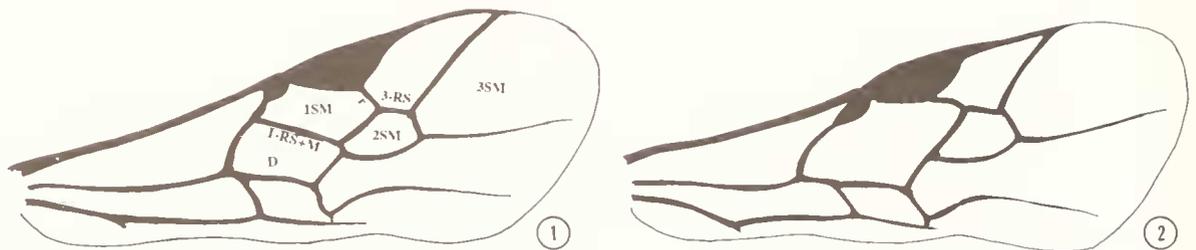
*Ascogaster longicornis* Huddleston. We treated this species as a synonym of *formosensis* based on type examination.

*Ascogaster perkinsi* Huddleston. See notes under *wuyiensis* below.

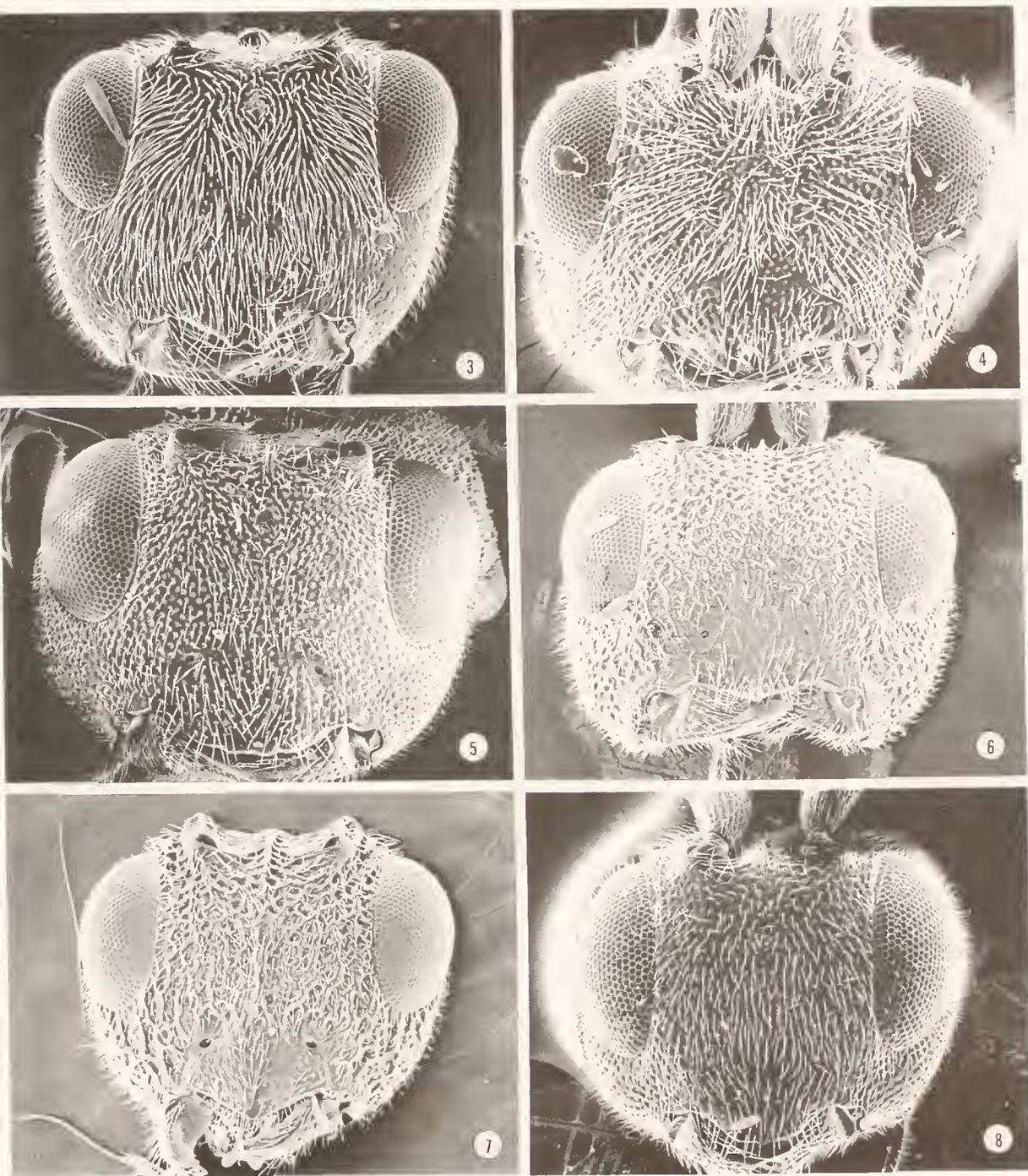
*Ascogaster reticulatus* Watanabe. Although this species was mentioned in their key, it was not discussed in the text. Thus, we must see their specimens before deciding upon the relationship of this species and *albitarsis*.

*Ascogaster rufidens* Wesmael. We did not find this species in any of the material that we studied. Again, their material should be studied before we confirm this species is in China.

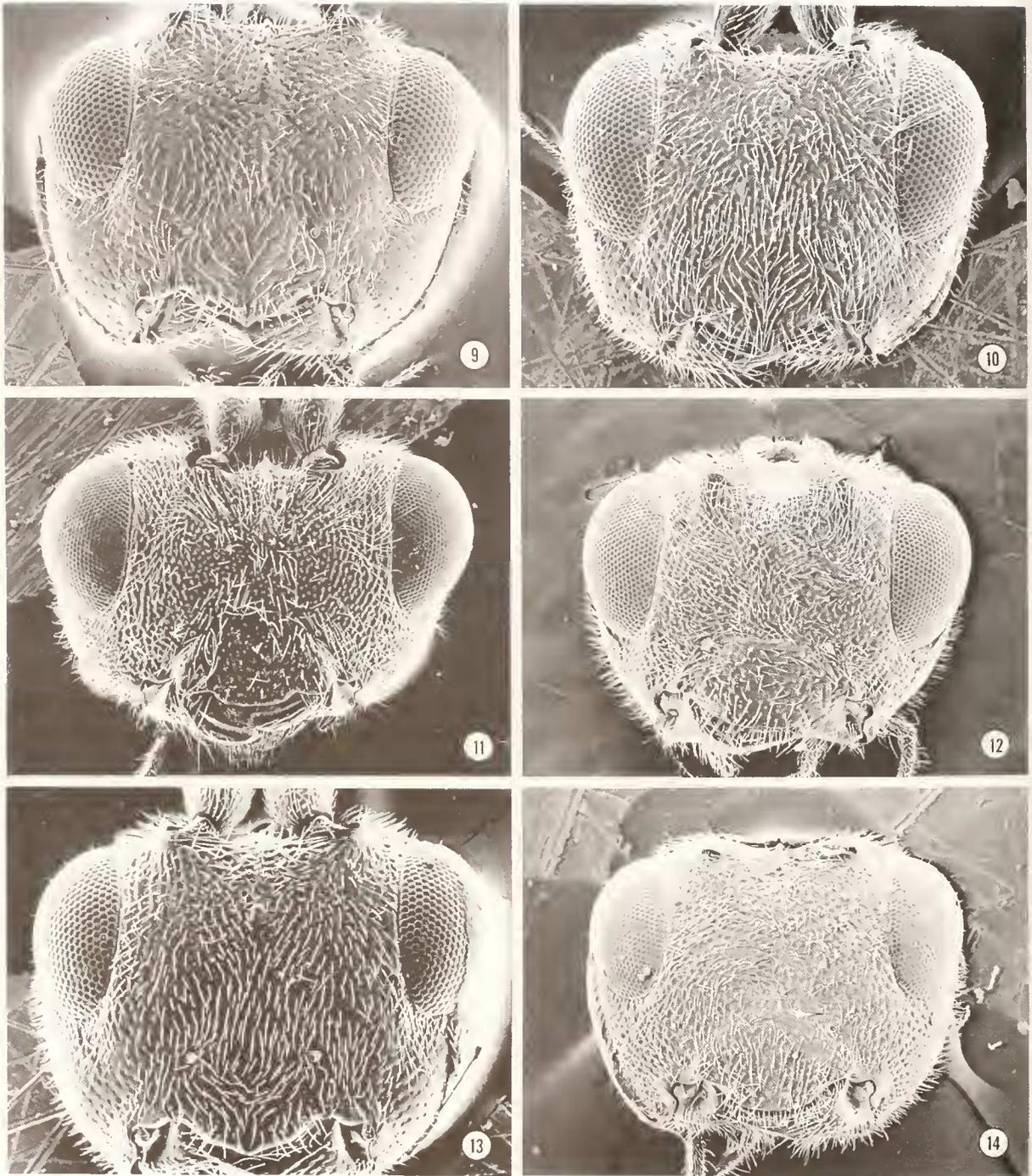
*Ascogaster wuyiensis* Chen and Huang. This species will run to *perkinsi* in our key based on the description in Chen et al., and the color of the clypeus and the shape of the yellow mark at the base of the carapace may be only variation in *perkinsi*. We described a new species, *lini*, which is related to *wuyiensis* and *perkinsi*. The validity of these three species must wait until specimens of *wuyiensis* are examined.



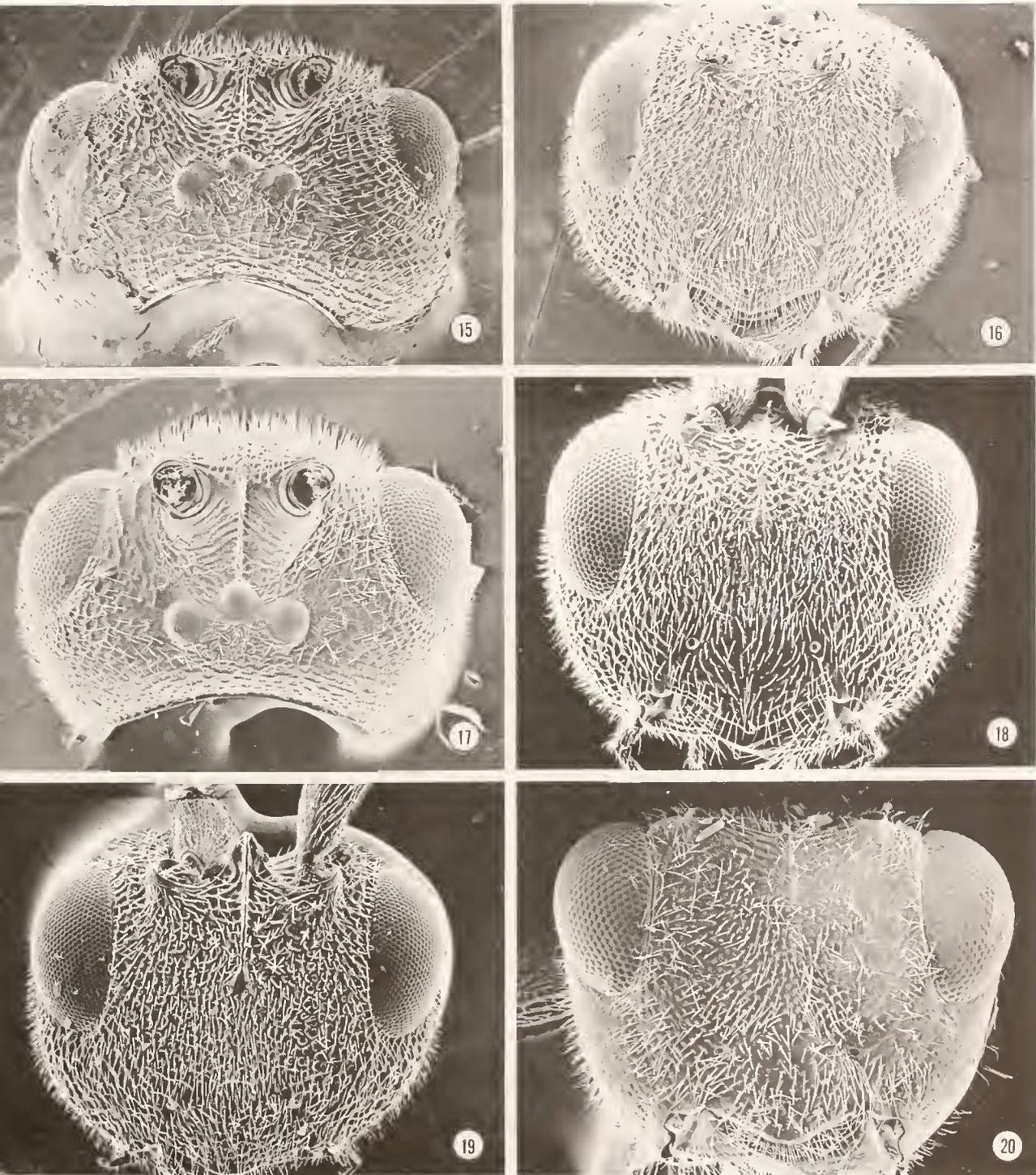
Figs. 1-2. Fore wings, somewhat diagrammatic. 1, *Ascogaster*. 2, *Chelonus*. SM=submarginal cells; D=discal cell.



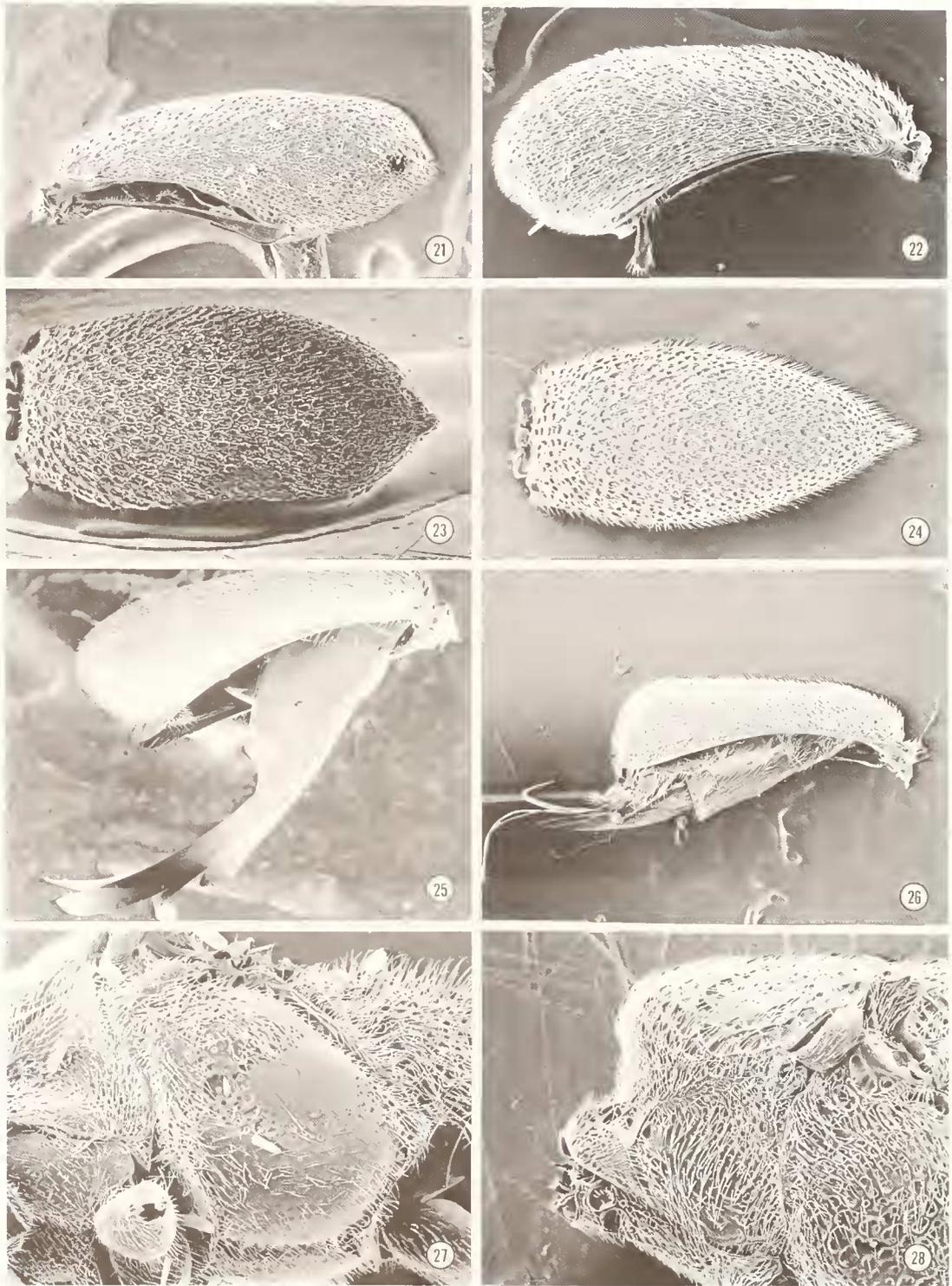
Figs. 3-8. Faces of *Ascogaster* species. 3, *arisanica* Sonan. 4, *dimorpha* n. sp. 5, *formosensis* Sonan. 6, *grandis* n. sp. 7, *fullawayi* (Baker). 8, *setula* n. sp.



Figs. 9-14. Faces of *Ascogaster* species. 9, *lini* n. sp. 10, *perkinsi* Huddleston. 11, *semenovi* Telenga. 12, *townesi* n. sp. 13, *rugulosa* n. sp. 14, *varipes* Wesmael.



Figs. 15-20. Heads of *Ascogaster* species. 15-16, *hei* n. sp.: 15, dorsal view; 16, face. 17-18, *quadridentata* Wesmael: 17, dorsal view; 18, face. 19, *armatoides* n. sp. 20, *consobrina* Curtis.



Figs. 21-28. Morphology of *Ascogaster* species. 21-26, metasomal gaster: 21, *grandis* n. sp.; 22, *perkinsi* Huddleston; 23, *acutus*