Phaenocarpa helophilae spec. nov. (Hymenoptera: Braconidae), a gregarious parasitoid of *Helophilus* larvae (Diptera: Syrphidae), with notes on related species

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For the first time a gregarious parasitoid belonging to the genus *Phaenocarpa* Foerster, 1862 (Braconidae: Alysiinae) is reported, and described as *P. helophilae* spec. nov. from England. The first record of Chloropidae as host for a *Phaenocarpa* species is given; *P. livida* (Haliday, 1838) reared from *Calamoncosis* (*Rhaphiopyga*) *glyceriae* Nartshuk, 1958. *Sathra debilis* Foerster, 1862, is synonymised with *P. livida* (Haliday). Additionally, *Phaenocarpa curticauda* spec. nov. from The Netherlands is described and fully illustrated. A lectotype is designated for *Alysia pectoralis* Zetterstedt, 1838, and *Phaenocarpa rufoflava* Papp, 1968, is recognised as a valid species.

Introduction

The genus *Phaenocarpa* Foerster, 1862 (Braconidae: Alysiinae: Alysiini) is a cosmopolitan genus commonly encountered in the Holarctic region with a moderate number of species; from The Netherlands 21 species are identified at the moment. The genus is characterised by having the third antennal segment usually distinctly shorter than the fourth segment (if about of equal length or only slightly longer, then vein M+CU of hind wing distinctly shorter than vein 1-M); vein 3-SR of fore wing longer than vein 2-SR; veins CU1b of fore wing and cu-a of hind wing present; vein CU1b of fore wing longer than vein 3-CU1; hind wing without vein r; mandible with 3 teeth; dorsope present; the second metasomal tergite smooth; and the apex of ovipositor sheath with or without spine. They are koinobiont endoparasitoids of cyclorraphous Diptera larvae belonging to the Anthomyiidae, Tephritidae, Drosophilidae, Lonchaeidae, Chloropidae (first report in this paper), Opomyzidae, (malacophagous) Sciomyzidae and Muscidae, and they emerge as adults from the host puparium.

For recognition of the subfamily Alysiinae, see van Achterberg, 1990, 1993, 1997, and for terminology used in this paper, see van Achterberg, 1988b. An asterisk indicates a new record for the country given.

Descriptions

Subfamily Alysiinae Stephens, 1829
Phaenocarpa Foerster, 1862
Phaenocarpa helophilae spec. nov.
(figs 1-13)

Phaenocarpa nina; Papp et al., 1996: 121.

Material.— Holotype, ♀ (NMS), "[England], Attenborough NR., near Nottingham, ex puparium [of] *Parhelophilus* ?*versicolo*r, coll, 21.v.[19]89 between *Typha* leaves, em. 15/18.vi.[19]89. Gregarious, G.E. Rotheray". Paratypes: 22 ♀♀ + 6 ♂♂ (NMS; RMNH): topotypic, all from same puparium (4 ♀♀ + 1 ♂ in bad condition); 1 ♀ (RMNH), "Netherlands: N.-B., Udenhout, "De Brand", 26.v-2.vi.1990, UTM FT 47 6225, Mal. tr., Ins. W. G. KNNV-Tilburg".

Holotype, ♀, length of body 2.6 mm, of fore wing 2.7 mm.

Head.— Antenna 1.2 times length of both fore wing and of body (figs 1, 3, 9), with 23 segments, length of third segment 0.9 times fourth segment (fig. 5), length of third, fourth and penultimate segments 4.3, 5.3 and 2.2 times their width, respectively; apex of scapus oblique and pedicellus rather large (fig. 3); length of maxillary palp 0.7 times height of head; OOL:diameter of posterior ocellus:POL = 9:2:6; frons glabrous and smooth; length of eye in dorsal view 1.4 times temple (fig. 6); temples subparallel-sided behind eyes (fig. 6); face smooth; anterior tentorial pits large (fig. 10); length of malar space 0.2 times basal width of mandible; mandible slender, not widened subapically, its medial length 1.6 times maximum width, second tooth somewhat longer than both other teeth, with incision between first and second tooth, first tooth with dorsal lamella (figs 2, 4); head 1.4 times as wide as mesoscutum (figs 6, 12).

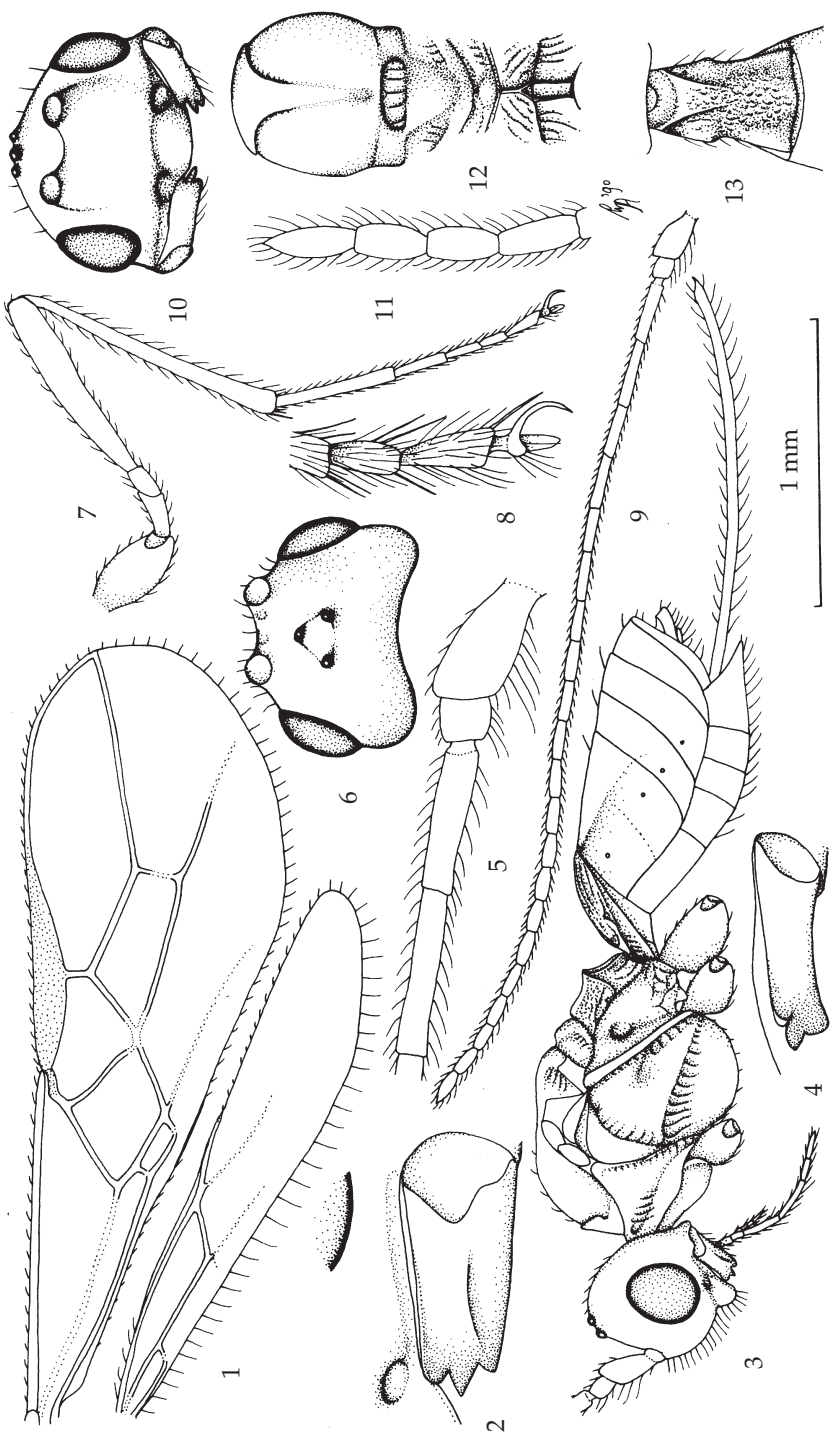
Mesosoma.— Length of mesosoma 1.4 times its height; side of pronotum largely smooth, but medio-anteriorly and posteriorly crenulate (fig. 3); precoxal sulcus complete, wide and coarsely crenulate (fig. 3); metapleuron largely smooth medially and rugose ventrally; notauli only anteriorly distinctly impressed, remainder obsolescent and smooth (fig. 12); medio-posterior depression of mesoscutum small and obsolescent (fig. 12); mesoscutum largely glabrous and smooth; scutellar sulcus wide and deep (fig. 12); scutellum distinctly convex; metanotum without median carina and slightly protruding dorsally (fig. 3); surface of propodeum rugulose anteriorly (fig. 12), with its carina protruding tooth-like in lateral view medially (fig. 3), its median carina strong on anterior half, and with narow parallel-sided medial area (fig. 12).

Wings.— Fore wing: 1-SR robust; r:3-SR:SR1 = 4:19:38; r slender and issuing medially from pterostigma (fig. 1); pterostigma elliptical (fig. 1); SR1 straight and ending close to apex of wing (fig. 1); 1-CU1:2-CU1 = 3:8; 2-SR:3-SR:r-m = 12:19:7; first subdiscal cell comparatively short, its length about 3 times its height (fig1 1); CU1a at level of 2-CU1; m-cu parallel to 1-M. Hind wing: M+CU:1-M = 11:17; only a short trace of m-cu present (fig. 1).

Legs.— Hind coxa smooth; tarsal claws very slender (fig. 8), with only a small basal protuberance; length of femur, tibia and basitarsus of hind leg 6.2, 12.2, and 8.0 times their width, respectively; hind femur largely smooth; hind tarsal segments without specialised setae; length of hind tibial spurs 0.2 times hind basitarsus.

Metasoma.— Length of first tergite 1.3 times its apical width, its surface finely and densely rugose medially, and largely smooth laterally (fig. 13), its dorsal carinae present in basal third of tergite, not united apically, and tergite strongly constricted behind spiracles (fig. 13); dorsope medium-sized; second tergite smooth; ovipositor slightly upcurved (fig. 3); length of ovipositor sheath 0.50 times fore wing and 1.4 times hind tibia, long setose and with an apical spine (fig. 13); hypopygium medium-sized and apically acute (fig. 3).

Colour.— Black; palpi, humeral plate and coxa ventrally brownish-yellow; remainder of legs and tegulae yellowish-brown; metasoma slightly brownish dorsally; wing



Figs 1-13, *Phaenocarpa helophilae* spec. nov., ♀, holotype. 1, wings; 2, mandible, maximum view on first (= dorsal) tooth; 3, habitus, lateral aspect; 4, mandible, maximum view on third (= ventral) tooth; 5, four basal antennal segments; 6, head, dorsal aspect; 7, hind leg; 8, outer hind claw; 9, antenna; 10, head, frontal aspect; 11, apex of antenna; 12, mesosoma, dorsal aspect; 13, first metasomal tergite, dorsal aspect. 1, 3, 7, 9: 1.0 × scale-line; 2, 4, 5, 8, 11: 2.5 × ; 6, 10, 12, 13: 1.3 ×.

membrane slightly infuscate; scapus, pedicellus and metasoma ventrally, pterostigma, parastigma and veins dark brown.

Variation.— Length of fore wing 2.3-2.7(-3.5) mm, and of body 2.3-2.6(-4.2) mm; antenna of ♀ with 23(15), 24(3) or 28(1) segments, of ♂ with 23(1), or 24(4) segments; median length of mandible 1.6-2.3 times its maximum width; length of first tergite of ♀ 1.3-1.4 times its apical width, rarely the constriction behind the spiracles is absent and basally tergite less narrowed than in *P. nina* (figs 13, 15); venation of male is similar to venation of female, but pterostigma is more slender.

Distribution.— *England, *Netherlands.

Biology.— Gregarious parasitoid of *Helophilus* (*Parhelophilus*) ?*versicolor* (Fabricius) (Diptera: Syrphidae). The host larvae live submerged in marshy habitats. Although gregarious development is well known in the related genus *Aphaereta* Foerster, 1862, this is the first species of *Phaenocarpa* found to be gregarious.

Notes.— The paratype from Udenhout was identified as *P. nina* (see Papp et al., 1996), but after repreparation this specimen proved to belong to *P. helophilae*, consequently, *P. nina* has to be removed from the Dutch list.

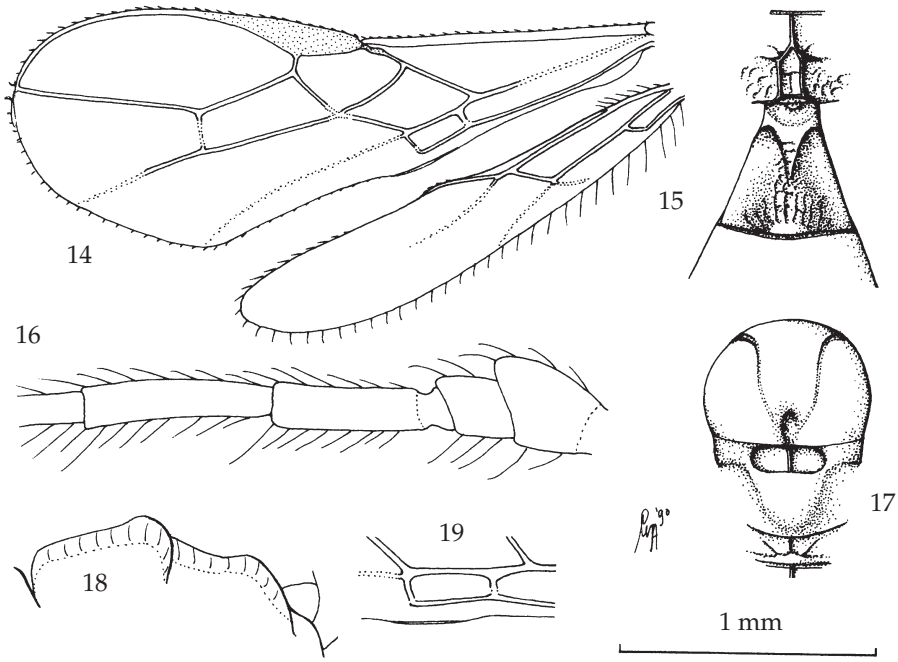
Related to *P. tiliae* Tobias, 1986 (also a parasitoid of Syrphidae: *Temnostoma* spec.), but *P. tiliae* has the pronotum reddish, length of mesosoma about twice its height, and antennal segments 26-27. Obviously, the type series of *P. tiliae* resulted from a mass-rearing of the Syrphid-larvae in *Tilia*-timber and this species may be gregarious as well.

Superficially similar to *P. nina* (Haliday, 1838; figs 14-19), but the lectotype of that species has a deep, comparatively long and wide medio-posterior depression of the mesoscutum (fig. 17), the carina of the propodeum rounded medio-dorsally (fig. 18), the first metasomal tergite more robust and not constricted behind its spiracles (fig. 15), and the mandible robust and distinctly widened subapically.

In Tobias' (1986) key it runs to *P. curvula* Thomson, 1895, but *P. curvula* has the third antennal segment about three times as long as wide, its subapical antennal segments are slightly (1.2-1.3 times) wider than long (according to the figure in Fischer, 1970), the ovipositor sheath about as long as hind tibia, the first subbasal cell of fore wing wider, the first metasomal tergite not rugulose, and the pterostigma wider.

In Fischer's (1970) key it runs to *P. nitida* (Thomson, 1895) or *P. trisulcata* Stelfox, 1950. However, the latter has 29-30 (♀) or 35-41 (♂) antennal segments, the notauli complete, the scapus and pedicellus yellowish, the metasoma brownish medially, the ovipositor sheath shorter than the metasoma, and the third antennal segment 0.7 times as long as fourth segment. *P. nitida* has the middle tooth of the mandible much longer than both lateral teeth, the second submarginal cell of fore wing wider, the first metasomal tergite more robust, vein 3-CU1 of fore wing distinct, the pterostigma wider, and the third antennal segment more robust.

In Fischer's (1990) incomplete key it runs to the *P. picinervis*-group, if the rather shallow indentation between the first and second mandibular teeth is interpreted as distinct enough to fit the definition. However, if it is considered to have an "in spitzem Winkel gebrochene Kante" (= first and second tooth angled rectangularly), then it runs to the *P. flavipes*-group. In the *P. picinervis*-group the intermediately developed notauli cause another problem, but it does not fit either in the group with reduced notauli, or in the group with (nearly) complete notauli. In the *P. flavipes*-group it runs to the second half of the key, but the length of the first metasomal tergite causes



Figs 14-19, *Phaenocarpa nina* Haliday, ♀, lectotype. 14, wings; 15, propodeum and first metasomal tergite, dorsal aspect; 16, four basal antennal segments; 17, thorax, dorsal aspect; 18, propodeum, lateral aspect; 19, detail of first subdiscal cell of fore wing. 14: 1.0 × scale-line; 15, 17, 19: 1.5 × ; 16, 18: 3.3 ×.

another problem; it is intermediate for the measurements given in couplet 11. Either it runs to *P. curvula* Thomson (for differences see above) or to *P. canaliculata* Stelfox, 1941, sharing with that species the comparatively short antenna and reduced notauli. However, *P. canaliculata* differs by the more robust mandible, with the middle tooth much longer than lateral teeth (van Achterberg, 1988a: figs 243, 244), the short vein r of fore wing, the less robust head in dorsal view (l.c., fig. 247), the shorter setose part of the ovipositor sheath (l.c., fig. 236), its much more slender first subdiscal cell of fore wing (l.c., fig. 239), and its biology (*P. canaliculata* is a solitary parasitoid of Muscidae in decaying organic matter (l.c., p. 59)).

The slender and short-toothed mandible of the new species is similar to the mandible of *P. eunice* (Haliday, 1838). However, *P. eunice* has a slender first subdiscal cell of fore wing (cf. fig. 20), the penultimate segments of antenna of ♀ more robust, length of the ovipositor sheath about 0.7 times fore wing (and about 1.4 times as long as the metasoma), the first metasomal tergite not distinctly constricted behind its spiracles, the wings more infuscate, and the hind femur distinctly sculptured (in *P. helophilae* largely smooth).

The new species may be separated from similar West Palaearctic species (sharing the ovipositor sheath distinctly longer than hind tibia, the antennal segments of ♀ 20-28, the tarsal claws distinctly longer than arolium and slender (fig. 8), and the fourth antennal segment 1.1-1.2 times third segment) as follows:

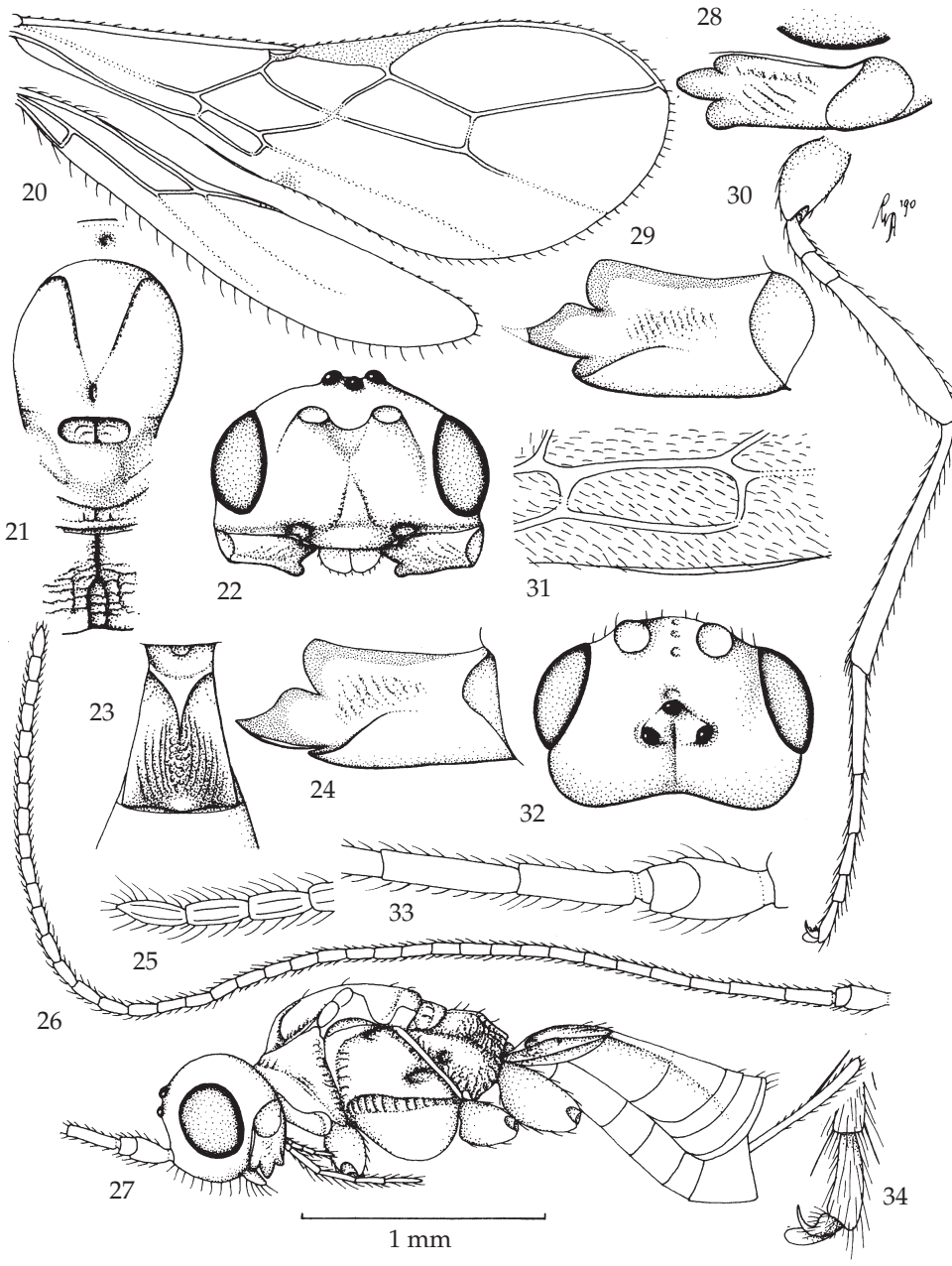
1. Pterostigma dark brown; first subdiscal cell of fore wing longer (vein 1-CU1 0.3-0.4 times vein 2-CU1; figs 1, 14); antennal segments of ♀ 22-28; vein m-cu of fore wing straight or nearly so, and less reclivous (figs 1, 14); vein 3-SR of fore wing distinctly longer than vein 2-SR (figs 1, 14) 2
- Pterostigma yellowish; first subdiscal cell of fore wing short (vein 1-CU1 about 0.7 times vein 2-CU1); antennal segments of ♀ about 20; vein m-cu of fore wing sinuate and strongly reclivous; vein 3-SR of fore wing slightly longer than vein 2-SR ... . ***P. zetteli*** Fischer, 1993
2. Hind femur smooth and yellowish(-brown); hind tarsal claw moderately long, its slender part about 0.7 times as long as hind basitarsus; wing membrane slightly infuscate; first subdiscal cell of fore wing robust (figs 1, 14) 3
- Hind femur largely sculptured and brown; hind tarsal claw enlarged, its slender part nearly (0.9 times) as long as hind basitarsus; wing membrane distinctly infuscate; first subdiscal cell of fore wing slender (cf. fig. 20) .. ***P. eunice*** (Haliday, 1838)
3. First metasomal tergite more slender and less widened apically (fig. 13); mandible slender, and subapically parallel-sided (fig. 2); medio-posterior depression of mesoscutum shallow, medium-sized to indistinct (fig. 12); length of ovipositor sheath about 0.5 times fore wing and about as long as metasoma; antennal segments of ♀ 23-28; posterior part of propodeum distinctly angled with anterior part of propodeum (fig. 3); vein 3-CU1 of fore wing departing from vein m-cu (fig. 1) ..... ***P. helophilae*** spec. nov.
- First tergite comparatively robust and strongly widened apically (fig. 15); mandible robust, and subapically distinctly widened; medio-posterior depression of mesoscutum deep and large (fig. 17); length of ovipositor sheath about 0.4 times fore wing and about 0.7 times metasoma; antennal segments of ♀ 22-23; posterior part of propodeum less angled with anterior part of propodeum (fig. 18); vein 3-CU1 of fore wing departing from vein CU1b (figs 14, 19) .. ***P. nina*** (Haliday, 1838)

Phaenocarpa curticauda spec. nov.
(figs 20-34)

Material.— Holotype, ♀ (RMNH), "Netherlands: Gld., Tongeren, Mal. Trap, 13.ix.1989, B. van Aartsen, RMNH'90". Paratypes (7 ♀♀ + 5 ♂♂): 2 ♀♀ (RMNH), "Netherlands: N.-B., Udenhout, "De Brand", 26.v-2.vi.1990, UTM FT 47 6225, Mal. tr., Ins. W. G. KNNV-Tilburg"; 1 ♀ (RMNH), id., but 9-16.vi.1990; 1 ♀ + 1 ♂ (RMNH), id., but 20.vi-1.vii.1990; 1 ♂ (RMNH), id., but 7-14.vii.1990; 1 ♂ (RMNH), id., but 21-28.vii.1990; 2 ♀♀ (RMNH), id., but 28.vii-4.viii.1990; 1 ♀ (RMNH), id., but 4-11.viii.1990; 1 ♂ (RMNH), id., but 11-18.viii.1990; 1 ♂ (RMNH), id., but 18-25.viii.1990.

Holotype, ♀, length of body and of fore wing both 2.7 mm.

Head.— Antenna 1.8 times length of fore wing and of body (figs 20, 26), with 40 segments, length of third segment 0.9 times fourth segment (fig. 33), length of third, fourth and penultimate segments 3.7, 4 and 2.7 times their width, respectively; apex of scapus concave and pedicellus medium-sized (figs 26, 33); length of maxillary palp 0.9 times height of head; OOL:diameter of posterior ocellus:POL = 10:3:7; frons glabrous and smooth; length of eye in dorsal view 1.9 times temple (fig. 32); temples subparallel-sided behind eyes (fig. 32); face largely smooth; anterior tentorial pits large (fig. 22); clypeus comparatively thin and protruding (fig. 27); length of malar space



Figs 20-34, *Phaenocarpa curticauda* spec. nov., ♀, holotype, but 24 of paratype from Udenhout, Netherlands. 20, wings; 21, mesosoma, dorsal aspect; 22, head, frontal aspect; 23, first metasomal tergite, dorsal aspect; 24, 29, mandible, maximum view on first tooth; 25, apex of antenna; 26, antenna; 27, habitus, lateral aspect; 28, mandible, maximum view on third tooth; 30, hind leg; 31, detail of first subdiscal cell of fore wing; 32, head, dorsal aspect; 33, four basal segments of antenna; 34, outer hind claw. 20, 26, 27, 30: 1.0 × scale-line; 21-23, 32: 1.5 × ; 24, 25, 28, 29, 31, 33, 34: 2.5 ×.

0.2 times basal width of mandible; mandible subparallel-sided, not widened subapically, its medial length 1.7 times maximum width of mandible (but teeth worn, cf. figs 24, 29), second tooth triangular with dorsal protuberance and much longer than both lobe-shaped lateral teeth, with incision between first and second tooth (figs 24, 29), first tooth without oblique dorsal lamella (figs 24, 29); head 1.7 times as wide as mesoscutum (figs 21, 32).

Mesosoma.— Length of mesosoma 1.3 times its height; side of pronotum smooth, but medio-anteriorly and posteriorly crenulate (fig. 27); precoxal sulcus complete, and largely widely crenulate (fig. 27); metapleuron smooth medially and rugose ventrally; notauli narrow and finely crenulate, nearly completely impressed, only obsolescent near medio-posterior depression (fig, 21); medio-posterior depression of mesoscutum deep and droplet-shaped (fig. 21); mesoscutum glabrous and smooth; scutellar sulcus wide and deep (fig. 21); scutellum convex; metanotum with distinct median carina only in anterior half (fig. 21) and not protruding dorsally (fig. 27); surface of propodeum coarsely rugose, but antero-laterally largely smooth (fig. 21), with its median carina distinct in anterior half and connected to a rather irregular and narrow medial area (fig. 21), carina not protruding tooth-like in lateral view medially (fig. 27).

Wings.— Fore wing: 1-SR slender elliptical (fig. 20); r:3-SR:SR1 = 1:17:34; r very short and issuing distinctly behind middle of pterostigma (fig. 20); pterostigma narrow elliptical (fig. 20); SR1 straight and ending close to apex of wing; 1-CU1:2-CU1 = 4:27; 2-SR:3-SR:r-m = 11:17:7; first subdiscal cell somewhat widened apically and rather long (figs 20, 31); CU1a distinctly below level of 2-CU1; m-cu converging to 1-M. Hind wing: M+CU:1-M = 10:18; m-cu absent (fig. 20).

Legs.— Hind coxa smooth; tarsal claws rather short and robust (fig. 34); length of femur, tibia and basitarsus of hind leg 4.7, 11.0, and 7.0 times their width, respectively; hind femur smooth; hind tarsal segments without specialised setae; length of hind tibial spurs 0.1 times hind basitarsus.

Metasoma.— Length of first tergite 1.1 times its apical width, its surface rugose medially, and largely smooth laterally (fig. 23), its dorsal carinae present in basal half of tergite, united apically and tergite not constricted behind spiracles (fig. 23); dorsope medium-sized and rather shallow; second tergite smooth; ovipositor straight (fig. 27), parallel-sided subapically, and without teeth ventrally; length of ovipositor sheath 0.26 times fore wing and 0.55 times hind tibia, sheath long setose and with no apical spine (fig. 27); hypopygium large and apically truncate (fig. 27).

Colour.— Black; face, malar space, and temple ventrally, brown; prothorax (rather pale), and metasoma ventrally yellowish-brown; ten basal antennal segments (but apical segments darker than basal segments), clypeus, mandible, tegulae, and legs (except coxa, trochanters and tarsi) yellowish-brown; palpi, coxae and trochanters pale yellowish; remainder of antenna, tarsi, and metasoma dorsally largely dark brown; only second and third tergites (except laterally) paler brown than remainder of metasoma; pterostigma and veins dark brown; wing membrane slightly infuscate, with brownish patch below vein CU1a.

Variation.— Length of fore wing 2.6-2.9 mm, of body 2.4-21.7 mm; antennal segments of ♀ 36(1), 37(1), 38(1), 39(2), or 40(2), and of ♂ 43(1), 45(1) or 47(3); length of first metasomal tergite 1.1-1.3 times its apical width; length of ovipositor sheath 0.21-

0.26 times fore wing; metasoma usually largely yellowish-brown, but first tergite dark brown and second and third tergites brown laterally; face usually dark brown, with clypeus yellowish brown; coxae whitish- or brownish-yellow; protuberance of second tooth of mandible medium-sized to comparatively large (figs 24, 29); medio-posterior depression of mesoscutum small to medium-sized.

Distribution.— *Netherlands.

Biology.— Unknown.

Notes.— Because *P. curticauda* has long antenna (about twice as long as body) consisting of about 40 segments, with no whitish medial band, it runs in my MS-key to *P. eugenia* (Haliday, 1838), but *P. eugenia* has the ovipositor sheath 1.2-1.6 times hind tibia, the hind femur and basitarsus robust and the third antennal segment short.

The new species is superficially similar to *P. livida* (Haliday, 1838), but that species has the ovipositor distinctly longer (at least about as long as hind tibia), the mandible and pterostigma more slender, less antennal segments, and the pterostigma paler. Males have also less antennal segments and possess a paler pterostigma.

Phaenocarpa eugenia (Haliday, 1838)

Alysia (*A.*) *eugenia* Haliday, (April) 1838: 234.
Phaenocarpa eugenia; Shenefelt, 1974: 1007-1008; Papp et al., 1996: 121; van Achterberg, 1998: 36 (lectotype designation).
Alysia pectoralis Zetterstedt, (?December) 1838: 402; Fischer, 1970: 436-438 (synonymy); 1990: 122.
Phaenocarpa orbicularis Gurasashvilli, 1983: 871, 786; Fischer, 1990: 122 (synonymy).

Material.— Lectotype of *A. pectoralis* here designated, ♂ (ZIL), "*A. pectoralis* ♂, Bossekop", with lectotype label by Dr R.A. Wharton but this selection in 1978 has never been published; 1 ♀ (RMNH), "Nederland, Waarder (Z.-H.), Oosteinde [34], 29.v.-3.vi.1972, C. van Achterberg"; 2 ♀♀ (RMNH), id., but 1-17.vi.1972; 1 ♂ (RMNH), id., but 12-13.vi.1971; 1 ♀ (RMNH), id., but Oosteinde 33, 12-14.vii.1973; 1 ♀ (RMNH), "Netherlands: N.-B., Udenhout, "De Brand", 21-28.vii.1990, UTM FT 47 6225, Mal. tr., Ins. W. G. KNNV-Tilburg"; 1 ♂ (RMNH), id., but 23.vi-1.vii.1990, and with reddish mesoscutum and mesosternum; 1 ♂ (RMNH), "[Netherlands], Giesenburg, 10.v.1967, C.J. Zwakhals"; 1 ♂ (RMNH), "Holland, Asperen, 24.v.1973, C.J. Zwakhals"; 1 ♂ (RMNH), id., but 21.v.1973; 1 ♂ (RMNH), id., but 8.vi.1973; 1 ♂ (RMNH), "Netherlands, Ov., Hasselt, Stadsgaten, 3.vi.1986, C.J. Zwakhals"; 1 ♂ (RMNH), id., but 14.vi.1986; 1 ♀ (RMNH), "Belgium (Liège), Hautes Fagnes, along river Helle, opposite Biol. Stat., 8.vii.1984, C. van Achterberg, RMNH'84"; 1 ♂ (RMNH), "Belgium (Liège), Robertville", "Mont Rigi Biol. Stat., 24-26.vi.1983, Excursie N.E.V., U.T.M. KA 9398"; 1 ♂ (RMNH), "Switzerland, Müienen, 21.vii.1967, 800 m, C.J. Zwakhals"; 1 ♂ (RMNH), "Norway, Selva, 63°36'N/9°43'E, n[ea]r entrance Trondheimsfjord, c 150 m, 11-18.viii.1973, C. van Achterberg".

Distribution.— Austria, *Belgium, England, Finland, Germany, Hungary, Ireland, Netherlands, *Norway, Sweden, *Switzerland, former USSR, and Yugoslavia.

Biology.— Unknown.

Note.— The lectotype of *A. pectoralis* is a normal male of *P. eugenia* with incomplete antenna (26 segments remain), a deep incision between first and second tooth of mandible, the notauli obsolescent posteriorly, the pterostigma yellowish, the prothorax completely yellowish, the hind femur comparatively robust, and the mesoscutum black(ish).

Phaenocarpa rufoflava Papp, 1968, stat. nov.

Phaenocarpa eugenia var. *rufoflava* Papp, 1968: 583 (two male syntypes from Vizesfás, Hungary; lectotype to be selected); Shenefelt, 1974: 1008.

Material.— All specimens labelled "Bulgaria, ex coll. Zaykov, RMNH Leiden, 1991", except the one from France; 1 ♀+ 1 ♂ (RMNH) "Rhodopi [Mts], Nikolovo, 12.vii.1976 (♀) & 17.viii.1976(♂), A. Zaykov"; 2 ♂♂ (RMNH) "Rhodopi, Thcigovtshovak, 9.viii.1979, A. Zaykov"; 1♂ (RMNH) "Rhodopi, N.R. Partizani, 25.vi.1978, A. Zaykov"; 1 ♀ (RMNH), "Bolgaria, 30 km CV, 950 m, lug Blalevski, 20.vii.[1]978, G. Deltsev"; 1 ♀ (RMNH), "Rhodopi, Ptshelarovo, 26.vi.1976, A. Zaykov"; 1 ♂ (RMNH), "Rhodopi, I. Batau, 25.vii. 1981, Zaykov"; 1 ♂ (RMNH), "Rhodopi, Chrabrino, 10.vii.1977, A. Zaykov"; 1 ♂ (RMNH), "Rhodopi, Boino, 6.vii.1976, A. Zaykov"; 1 ♂ (RMNH), id., but 6.vi.1976 and "*Phaenocarpa eugenia* var. *rufoflava* Papp, ♀ [sic!], det. Papp J., 1976"; 1 ♂ (RMNH), "Rhodopi, h. Zdravei, 27.vii.1977, J. Kolarov"; 1 ♀+ 1 ♂ (RMNH), "Staro Orjokova, 12.vii.[19]87, Zaykov"; 1 ♀ (RMNH), "Rakovsko, Ch. more, 11.vii.[19]87, Zaykov"; 1 ♀ (RMNH), "France, Gard, M.J. Gijswijt", "La Roque s/Cèze, 19.ix.1988".

Distribution.— *Bulgaria, *France, Hungary.

Biology.— Unknown.

Note.— This "var." of *P. eugenia* is not closely related to *P. eugenia* (Haliday), as demonstrated by e.g. the shape of the mandible, and therefore it is here treated as a valid species. It is similar to *P. styriaca* Fischer, 1970, e.g. the number of antennal segment of ♀ 33-37, face sometimes with some striae latero-dorsally, no distinct incision between the first and second tooth of mandible, the mandible distincly widened subapically, and the ovipositor sheath somewhat longer than hind tibia or metasoma. *P. rufoflava* differs from *P. styriaca* by its smooth hind femur, completely orange-brown head and mesosoma, shallow and smooth posterior half of notauli, and largely smooth propleuron.

Phaenocarpa eunice (Haliday, 1838)

Alysia (*A.*) *eunice* Haliday, 1838: 235.
Phaenocarpa eunice; Shenefelt, 1974: 1008; van Achterberg, 1998: 36 (lectotype designation).
Phaenocarpa (*Rhopaloneura*) *nimia* Stelfox, 1941: 6 (synonymised by Stelfox, 1944).

Material.— 1 ♀ (RMNH), "Nederland, Waarder (Z.-H.), Oosteinde [34], 1-5.ix.1972, C. van Achterberg"; 1 ♀ (RMNH), id., but 1-17.vi.1972; 1 ♀ (RMNH), id., but 11-15.viii.1972; 2 ♀♀ (RMNH), id., but 16-20.viii.1972; 1 ♀ (RMNH), id., but 21-25.viii.1972; 1 ♀ (RMNH), id., but Oosteinde 33, 20-22.vi.1973; 1 ♀ (RMNH), id., but 14-16.vi.1973; 1 ♀ (RMNH), id., but 1-15.viii.1974; 1 ♂ (RMNH), "[England], Sutton C., Norfolk TG 373 235, 17-31.viii.[19]90, E. Anglia Fen Survey, A.P. Foster, NCC NMSZ 1992.161".

Distribution.— England, Ireland, *Netherlands.

Biology.— Unknown.

Phaenocarpa livida (Haliday, 1838)

Alysia (*A.*) *livida* Haliday, 1838: 236.
Phaenocarpa livida; Shenefelt, 1974: 1010; Papp et al., 1996: 121; van Achterberg, 1998: 53-54 (lectotype designation).
Sathra debilis Foerster, 1862: 267; Shenefelt, 1974: 1007. **Syn. nov.**

Material.— 2 ♀♀ (RMNH), "Germany: ex host on *Glyceria maxima* (Hartm.)", "D., Lützenburg, Klärwerk, Spülfläche, geschlüpft 11.ix.1990, leg. Pusch", "Larvenparasit von *Calamoncosis glyceriae* (Dipt., Chloropidae), w.l. leg. 14.viii., aus Pupa 11.ix.[19]90, leg. Pusch"; 2 ♂♂ (RMNH), topotypic, but em. 8.ix.1990; 1 ♀ (RMNH), "Nederland, Oostvoorne (Z.-H.), Biol. Stat.,28.v-15.vii.1974, C. v. Achterberg"; 3 ♀♀ (RMNH), id., but, 2-14.viii.1974; 1 ♀ (RMNH), id., but, 14.viii-5.ix.1974; 3 ♀♀ (RMNH), id., but, 5-30.ix.1974; 1 ♀ (RMNH), id., but 1-25.vi.1975; 2 ♀♀ (RMNH), "Nederland, Dr., Wijster, opposite Biol. Stat., 17-24.vi.1974, C. v. Achterberg"; 1 ♀ (RMNH), id., but 26.vi-5.vii.1974, compared with lectotype of *A. livida*; 1 ♀ (RMNH), id., but 2-9.viii.1974; 1 ♀ (RMNH), id., but 20-26.viii.1976, compared with lectotype of *A. livida*; 1 ♀ (RMNH), id., but 1-6.ix.1974; 1 ♀ (RMNH), id., but 13-20.ix.1974; 1 ♂ (RMNH), id., but 9-16.vi.1975; 1 ♀ (RMNH), id., but 28.viii-5.ix.1975; 1 ♀ (RMNH), id., but 8-15.ix.1975; 1 ♀ (RMNH), id., but 15-22.ix.1975; 1 ♀ (RMNH), id., but 11-18.vi.1976; 1 ♀ + 1 ♂ (RMNH), id., but 16-23.vii.1976; 1 ♂ (RMNH), id, but, 5-12.viii.1977; 1 ♀ (RMNH), id., but 28.vii-5.viii.1978; 1 ♀ (RMNH), "Nederland, Waarder (Z.H.), Oosteinde 34, 9-10.vii.1971, C. van Achterberg", "*Alnus-Salix* forest on peat in cultured area, Townes-trap"; 1 ♀ (RMNH), id., but 1.viii.1971; 1 ♀ (RMNH), id., but 2-3.x.1071; 1 ♀ (RMNH), id., but 10-11.v.1972; 2 ♀♀ (RMNH), id., but 1-17.vi.1972; 2 ♀♀ (RMNH), id., but 18-30.vi.1972; 3 ♀♀ + 1 ♂ (RMNH), id., but 1-5.vii.1972; 1 ♀ (RMNH), id., but 6-10.viii.1972; 1 ♀ (RMNH), id., but 26-31.viii.1972; 1 ♀ + 3 ♂♂ (RMNH), id., but 21-25.ix.1972; 1 ♀ (RMNH), id., but 11-15.x.1972; 1 ♀ + 1 ♂ (RMNH), id., but Oosteinde 33, 17-19.vi.1973; 1 ♀ (RMNH), id., but 23-30.vi.1975; 1 ♂ (RMNH), id., but 1-6.vii.1975; 1 ♀ (RMNH), "Neth.: prov. Limburg, Geulle, Bunderbos bij Oostbroek, 10-20.ix.1988, P. Thomas"; 1 ♀ (RMNH), "Netherlands, Rijckholt (Z.L.), 18-29.viii.1975, C. van Achterberg"; 1 ♀ (RMNH), "Netherlands, Melissant (Z.H.), at light, 19-27.vi.1975, K.J. Huisman"; 1 ♀ (RMNH), "Netherlands, Meyendel, nr The Hague, Bierlap, inner dunes, 28.vi-4.vii.1974, A.P. M. v.d. Zon"; 1 ♀ (RMNH), id., but 11-18.x.1974; 1 ♀ (RMNH), "Netherlands: N.-B., Udenhout, "De Brand", 28.iv-6.v.1990, UTM FT 47 6225, Mal. tr., Ins. W. G. KNNV-Tilburg"; 4 ♀♀ + 1 ♂ (RMNH), id., but 6-13.v.1990; 1 ♀ (RMNH), id., but 13-19.v.1990; 7 ♀♀ + 6 ♂♂ (RMNH), id., but 19-26.v.1990; 8 ♀♀ + 2 ♂♂ (RMNH), id., but 26.v-2.vi.1990; 2 ♀♀ (RMNH), id., but 2-9.vi.1990; 2 ♀♀ (RMNH), id., but 9-16.vi.1990; 1 ♀ + 1 ♂ (RMNH), id., but 21-26.vi.1990; 4 ♂♂ (RMNH), id., but 26.vi-1.vii.1990; 1 ♀ (RMNH), id., but 1-7.vii.1990; 3 ♂♂ (RMNH), id., but 7-14.vii.1990; 2 ♀♀ + 3 ♂♂ (RMNH), id., but 14-21.vii.1990; 9 ♀♀ (RMNH), id., but 21-28.vii.1990; 3 ♀♀ (RMNH), id., but 4-11.viii.1990; 4 ♀♀ (RMNH), id., but 11-18.viii.1990; 2 ♀♀ (RMNH), id., but 18-25.viii.1990; 1 ♀ (RMNH), id., but 25.viii-1.ix.1990; 3 ♂♂ (RMNH), "Netherlands, Nunspeet, 30.v.1982, C. v. Achterberg"; 1 ♀ (RMNH), "[Netherlands], Schayk, *Larix*, 17.v.1944 H.T[eunissen]"; 1 ♀ (RMNH), "Holland, Asperen, 20.vi.1973, C.J. Zwakhals"; 1 ♀ (RMNH), "Netherlands, Putten, M[-alaise] T[rap], 21.vi.1973, J. v.d. Vecht"; 1 ♂ (RMNH), id., but 9.viii.1973; 1 ♀ (RMNH), "Netherlands, Gulpen (Z.L.), nr railway, 27-31.v.1974, C. v. Achterberg"; 1 ♀ (RMNH), "Netherlands, Lienden (Gld.), Schuilenburg, 4-6.vii.1972, K.,W.R. Zwart; 1 ♀ (RMNH), id., but 5.viii.1970; 1 ♂ (RMNH), "Ireland, Cork, ex mass rearing of cereal aphids, 1987, P.S. Giller, RMNH'98"; 1 ♂ (RMNH), "Schweiz, Schwyz, Brunnen, 19-29.viii.1973, B.J. Lempke"; 1 ♀ (RMNH), "Norway, Oppdal, Kongsvoll, Kvernbekken, 26.vii.1978, J.O. Solem"; 1 ♀, holotype of *S. debilis* (ZMB), "25/155", "[Germany], Aachen", "Frst", "*debilis* Frst"; 1 ♀ (RMNH), "Germania, Thuringia", "ex coll. Schmiedeknecht", "*Phaenocarpa livida* Hal. [det. Schmiede knecht]"; 1 ♀ (RMNH), "Bulgaria, ex coll. Zaykov, RMNH Leiden 1991", "Rhodopi [Mts], Chrabrino, 25.v.1978, A. Zaykov".

Biology.— This species is obviously a specialised parasitoid of dipterous larvae living in stems of grasses. The only host record in the literature concerns *Geomyza* (*Baliptera*) *tripunctata* Fallén (Opomyzidae; Thomas, 1938). The reared specimens mentioned above were found by Mr C. Pusch (University of Kiel, Germany) during his study of the entomofauna of the grass *Glyceria maxima* (Hartm.), which grows in eutrophic marshy microhabitats. It resulted in a new host family, the Chloropidae, being recorded for the genus *Phaenocarpa* Foerster; the host proved to be *Calamoncosis* (*Rhaphiopyga*) *glyceriae* Nartshuk, 1958.

The holotype of *S. debilis* Foerster belongs without doubt to the genus *Phaenocarpa*.

It is clear that Foerster frequently overlooked the presence of vein CU1b of fore wing: under the genus *Asobara* in his collection are several specimens of *P. livida*, despite the fact that according to his diagnosis of the genus *Asobara* these specimens should have this vein absent, which is not the case. The male holotype of *S. debilis* has the mandible slender with its middle tooth much longer than both lateral teeth, separated from the dorsal tooth by a cleft, and vein r of the fore wing is short. The first metasomal tergite is subparallel-sided, which is probably typical for males of *P. livida*.

Variation.— *P. livida* is a variable species, both morphologically and in colour. The first tergite may be slender, subparallel-sided (especially in males) or distinctly widened apically, and the mandible may be moderately robust to very slender and parallel-sided. The length of the ovipositor sheath, the long and slender second tooth of the mandible (separated from the first tooth by a cleft), the rather robust tarsal claws, the shape of the penultimate antennal segments of the female, the length of the antenna (1.5 (♀)-1.7 (♂) times fore wing), the short vein r of fore wing and the slender first subdiscal cell of fore wing allow a reliable identification. Especially the specimens reared from *Calamoncosis glyceriae* are melanistic; the metasoma (except the first tergite) is dark brown (♀) or the basal half of metasoma largely brown (♂). The mesoscutum and scutellum may be brown. The male has many more antennal segments and a darker and wider pterostigma than males of *P. curticauda*.

Distribution.— Austria, *Bulgaria, England, Germany, Hungary, Ireland, Netherlands, *Norway, Romania, Sweden, *Switzerland, former USSR and Yugoslavia.

Phaenocarpa nina (Haliday, 1838)
(figs 14-19)

Alysia (*A.*) *nina* Haliday, 1838: 236.
Phaenocarpa nina; Shenefelt, 1974: 1011; van Achterberg, 1998: 62 (lectotype designation).

Material.— Lectotype, ♀ (NMI). See van Achterberg (1998) for label data.

Distribution.— Austria, Scotland (Hebrides), Russia (Kamchatka).

Biology.— Unknown.

Note.— This species has never before been illustrated and is rather difficult to recognise (see key in this paper); it is resembles *P. helophilae* spec. nov. and can be recognised by the differences listed in the key, in addition to the figures, given in this paper.

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NMI stands for National Museum of Ireland, Dublin; NMS for National Museums of Scotland, Edinburgh; RMNH for Nationaal Natuurhistorisch Museum, Leiden; ZIL

for Zoological Institute, Lund, and ZMB for Zoologisches Museum, Humboldt Universität, Berlin.

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