

**Four New Species of the Wasp Genus *Celonites* Latreille, 1802
(Hymenoptera: Vespidae: Masarinae) from South-western Africa,
Designation of Neotype for *C. michaelsoni* von Schulthess, 1923, Species
Representation in Namibia, and Key to Species Occurring in Namibia**

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Abstract.—Four new species of the genus *Celonites* Latreille, 1802 (Hymenoptera: Vespidae: Masarinae) are described from south-western Africa: *heliotropii* and *pulcher* from Namibia, *kalahariensis* from Namibia and the adjacent trans-Orange part (Gordonia) of the Northern Cape of South Africa, and *arenarius* from the north-western corner (Richtersveld) of the Northern Cape. A neotype is designated for the widespread, chiefly Namibian *Celonites michaelsoni* von Schulthess, 1923, with which *C. garipeensis* Gess, 1997 is sunk into synonymy. Namibian records are given for *C. andrei* Brauns, *C. capensis* Brauns, *C. clypeatus* Brauns, and *C. tumidiscutellatus* Gess, all better known from South Africa. Distribution maps are given for all nine species and forage plant records are included for eight. A key to the species of *Celonites* occurring in Namibia is given.

Key words.—Hymenoptera, Vespidae, Masarinae, *Celonites*, new species, Namibia, southern Africa

The genus *Celonites* Latreille was revised by Richards (1962) as part of his study of the Masarinae of the world. He dealt with a total of 26 species from the Palaearctic and Afrotropical regions, eight species being from southern Africa. Amongst a number of species mentioned but not examined by Richards was one additional southern African species, *C. michaelsoni* von Schulthess from the present day Namibia, known only from the holotype which he rightly believed to have been destroyed in Hamburg during World War 2.

Since 1962 seven additional species have been recognised from southern Africa, three described by Gess (1997) and four described in the present paper. The discovery of these species resulted from purposeful collecting in under-collected parts of the Western and Northern Cape, South Africa and particularly in Namibia. The overall known distribution of the genus in southern Africa has been given by Gess and Gess (2004b: Fig. 7).

As no *Celonites*, other than the single specimen of *C. michaelsoni*, have previously been recorded from Namibia, particular attention is paid to the fauna of that country from which eight species are now known: the here recognized and widespread *C. michaelsoni* von Schulthess, *C. heliotropii* sp. nov., *C. pulcher* sp. nov., *C. kalahariensis* sp. nov. and four species previously known from South Africa, *C. andrei* Brauns, *C. capensis* Brauns, *C. clypeatus* Brauns, and *C. tumidiscutellatus* Gess. It is highly probable that *C. arenarius* sp. nov., described from the southern bank of the Orange River, will also be found in Namibia.

The key is restricted to those species occurring in Namibia. A key to all the southern African species was attempted but was found to be impracticable at the present time due to the paucity of material of some species.

The notation used for expressing geographic co-ordinates is as in the gazetteer

of *The Times Atlas of the World* (1981). The figures before the stop are degrees, those after the stop are minutes; the stop is **not** a decimal point.

For purposes of plotting distributions, co-ordinates have been given in square brackets in the text for those localities for which none are given on the data labels.

On a few data labels from collections other than that of the Albany Museum the collecting locality is followed by degree latitude and degree longitude and by half- and quarter-degree reference letters (e.g., 3218BB) according to the Degree Reference System of Leistner and Morris (1976). As this system is not universally understood an attempt has been made here to find on a map the localities concerned and to add in square brackets the co-ordinates expressed in the manner adopted in this paper (e.g., 3218BB [32.11S 18.54E]).

In listing the material examined, the localities have been arranged, as far as practicable, in north to south order within Namibia or, in the case of South Africa, within provinces.

Acronyms here used for institutions in which material is housed are: AMG = Albany Museum, Grahamstown, South Africa; CAS = California Academy of Sciences, San Francisco, United States of America; NCP = National Collection of Insects, Pretoria, South Africa; NNIC = Namibian National Insect Collection, Windhoek, Namibia; ZMH = Zoologisches Museum Hamburg, Hamburg, Germany.

DESCRIPTIONS OF SPECIES AND COLLECTION DATA

Celonites heliotropii Gess, new species

Celonites sp. (undescribed): Gess and Gess, 2004a: 39 (flower visiting).

Diagnosis.—Both sexes: relatively small (5.6–7.3 mm); black, with pronotum, tegula, scutellum and terga reddish brown; clypeus and frons without carinae. Fore femur, particularly in female, postero-

ventrally produced in proximal half (Fig. 10). Male: most of mandibles, entire labrum and clypeus; variably developed facial markings and in some specimens underside of proximal flagellomeres, lemon yellow. Male genitalia as in Fig. 1.

Description.—**Female**: Black. The following are dark reddish-brown: distal half of mandible; underside of antennal club; pronotum; tegula; scutellum and median part of metanotum; in some specimens large spot anteriorly on mesopleuron, propodeal lamella laterally; in great majority of specimens terga I – VI (except for black bases); sterna I, II and VI and lateral and posterior margins of III – V; femur (distally), tibia and tarsi of all legs. Wings browned.

Length 5.8–7.3 mm (average of 4: 6.6 mm), length of front wing 4.4–5 mm (average of 4: 4.7 mm), hamuli 7 or 8; length of extended tongue 3.9 mm.

Head 1.3× as wide as long (measured across eyes and from vertex to bottom of emargination of clypeus respectively), frons and clypeus not carinate. Clypeal disc markedly raised, with surface finely reticulate punctate and with microsculptured interstices; frons, vertex and occiput more coarsely reticulate punctate, with smooth and shiny interstices. Frons slightly raised above and between antennal sockets and very slightly depressed medially above swollen area.

Pronotum, mesoscutum, mesopleuron, scutellum and dorso-lateral part of propodeum similarly punctured to frons and vertex, shiny. Scutellum gently convex, anteriorly not raised above level of mesoscutum. Tegula circa 1.9× as long as maximum width, posteriorly narrowed with outer margin curving inwards towards rounded but acute posterior angle.

Propodeal declivity markedly longitudinally rugoso-punctate. Lateral lamella of propodeum broad, with surface in same plane as adjacent median part, its outer margin minimally curved, its apex truncate, separated from median part by

narrow incurved slit. Terga more finely and closely punctured than thorax; interstices microsculptured; postero-lateral angles produced, acutely pointed; hind margins entire (non-crenulate).

Fore femur (Fig. 10, with for comparison the unmodified front leg of *C. michaelsoni*, Fig. 11) postero-ventrally produced in proximal half; end of tibia when folded against femur coinciding with produced region; tarsus short (only 1.2× tibial length); underside of tibia with moderately dense, short setae, tarsus setose throughout but with setae particularly dense on underside of tarsomeres I – IV where forming stiff brush.

Male: Black. The following are lemon yellow: most of mandible; entire labrum and clypeus; variably developed supra-clypeal spot medially on frons; usually small to minute spot in lower half of ocular sinus; in some specimens underside of proximal flagellomeres. The following are various shades of reddish-brown: flagellomeres; pronotum (colour grading almost to yellow on humeral angle; tegula (colour grading almost to yellow anteriorly); scutellum and median part of metanotum; large spot anteriorly on mesopleuron; propodeal lamella laterally; transverse bands on terga I – VI (colour of each band dark adjacent to black base, lighter posteriorly, grading almost to yellow on postero-lateral angles); sterna I – VI (partially) and VII (totally); femur (distally), tibia and tarsi of all legs (streaks on tibiae almost yellow). Wings lightly browned (paler than those of female).

Length circa 5.6 mm; length of front wing circa 3.9 mm; hamuli 6; length of extended tongue circa 3 mm.

More gracile than female but structurally similar, apart from usual more markedly swollen antennal club and more pronounced postero-lateral angles of terga.

Genitalia in ventral view as in Fig. 1; in dorsal view with parameres distally subtruncate, posterior margin of each paramere gently concavely curved from round-

ed inner posterior angle to protruding but rounded outer (lateral) posterior angle.

Etymology.—The name *heliotropii*, genitive singular, is formed from the generic name of the plant *Heliotropium tubulosum* (Boraginaceae) to the flowers of which the wasp appears to be restricted for purposes of foraging for nectar or nectar and pollen.

Material examined.—Holotype: ♀, **NAMIBIA:** 19 km SSW of Uis on road to Henties Bay (21.27S 14.45E), 18.iv.2002 (F. W. and S. K. Gess) (visiting white flowers of *Heliotropium tubulosum* E. Mey. ex DC., Boraginaceae) [AMG]. Paratypes: **NAMIBIA:** near Palmwag (19.53S 13.55E), 26.iii.2004, 1 ♀ (visiting white flowers of *Heliotropium tubulosum* E. Mey. ex DC., Boraginaceae); Two Palms, near Palmwag (19.53S 13.54E), 27.iii.2004, 8 ♀♀ (visiting white flowers of *Heliotropium tubulosum*); same locality, 28.iii.2004, 13 ♀♀ (visiting white flowers of *Heliotropium tubulosum*); Uis to Omaruru (21.14S 15.00E), 14.iii.2004, 13 ♀♀ (12 ♀♀ visiting white flowers of *Heliotropium tubulosum*); 19 km SSW of Uis on road to Henties Bay (21.27S 14.45E), 17.iv.2002, 6 ♀♀, (3 ♀♀ visiting white flowers of *Heliotropium tubulosum*; 1 ♀ associated with hole in ground; 1 ♀ on ground); same locality, 18.iv.2002, 8 ♀♀, 1 ♂ (7 ♀♀, 1 ♂ visiting white flowers of *Heliotropium tubulosum*; 1 ♀ on ground); Gross Spitzkuppe (21.51S 15.12E), 19.iv.2002, 6 ♀♀ (visiting white flowers of *Heliotropium tubulosum*); 77 km E of Henties Bay on road to Klein Spitzkuppe (21.54S 14.58E), 19.iv.2002, 13 ♀♀ (visiting white flowers of *Heliotropium tubulosum*); 58 km SW of Usakos on road to Swakopmund (22.12S 15.10E), 23.iv.2002, 9 ♀♀, 1 ♂ (7 ♀♀, 1 ♂ visiting white flowers of *Heliotropium tubulosum*; 2 ♀♀ on ground next to *Heliotropium tubulosum*); 33 km by road from Swakopmund to Usakos, near Rössing Mtn. (22.34S 14.49E), 22.iv.2002, 1 ♀; same locality, 28.iv.2002, 1 ♀ (at *Heliotropium tubulosum*) – (all F. W. and S. K. Gess) – [all AMG]; Karibib District, 15 km W Karibib [21.56S 15.43E], 26.ii.1990, 1 ♂; Karibib District, 55 km SW Usakos [22.16S 15.08E], 1.iii.1990, 1 ♀; Karibib District, 65 km SW Usakos [22.20S 15.05E], 24.ii.1990, 2 ♀♀, 1 ♂ - (all W. J. Pulawski) [all CAS]; Damaraland, 6 km N Arandis (22.22S 14.59E), 3–31.vii.1984, 1 ♀, 8.v.–5.vi.1984, 2 ♀♀, 5.vi.–3.vii.1984, 2 ♀♀ (all J. Irish; H. Liessner); same locality, 9.iv.–6.v.1985 (J. Irish, H. Rust), 1

♀; Swakopmund Dist., Rössing Mine (22.28S 15.02E), 13.iii.–10.iv.1984, 2 ♀♀, 10.iv.–8.v.1984, 1 ♀ (both J. Irish; H. Liessner); Swakopmund Dist., Upper Panner Gorge (22.29S 15.01E), 10.iv.–8.v.1984 (J. Irish; H. Liessner), 5 ♀♀; Swakopmund Dist., Upper Ostrich Gorge (22.29S 14.59E), 13.iii.–10.iv.1984, 2 ♀♀, 10.iv.–8.v.1984, 2 ♀♀ (both J. Irish; H. Liessner); same locality, 12.ii.–11.iii.1985, 1 ♀, 1 ♂, 9.iv.–6.v.1985, 1 ♀ (both J. Irish; H. Rust); Swakopmund Dist., Lower Ostrich Gorge (22.30S 14.58E) 13.iii.–10.iv.1984 (J. Irish; H. Liessner), 1 ♀; same locality, 12.ii.–11.iii.1985, 1 ♂, 9.iv.–6.v.1985, 1 ♀ (both J. Irish; H. Rust) – [all NNIC].

Geographic distribution.—(Fig. 12): Known only from Namibia, collection localities being north, northeast and east of Swakopmund in the Mopane Savanna, the Central Namib, and the Semi-desert and Savanna Transition of Giess (1971).

Floral associations.—Boraginaceae (*Heliotropium tubulosum* E. Mey. ex DC).

Discussion.—At four localities the species has been found foraging on the flowers of *Heliotropium tubulosum* in company with the masarine *Jugurtia namibicola* Gess which similarly appears restricted to this plant (Gess and Gess 2004: 39, Gess 2004: 709). *Celonites heliotropii* is the only southern African *Celonites* known to forage on *Heliotropium*, however, *C. jousseamei* du Buysson has been recorded on flowers of this genus in the Sudan and in Cyprus. G. A. Mavromoustakis found *C. cypricus* de Saussure and *C. rugiceps* Bischoff to be confined to *H. ?villosum* Willd. and to *H. europaeum* L. respectively (Richards 1962: 224).

Celonites pulcher Gess, new species

Celonites sp. nov. F: Gess and Gess, 2003: 41 (flower visiting).

Diagnosis.—Both sexes: (7.2–7.9 mm); black or in some specimens with ground colour of pronotum, mesopleuron, scutellum, propodeum and gaster largely reddish brown; head, pronotum, mesopleuron, tegula, propodeum and gaster with yellowish-white markings. Clypeus

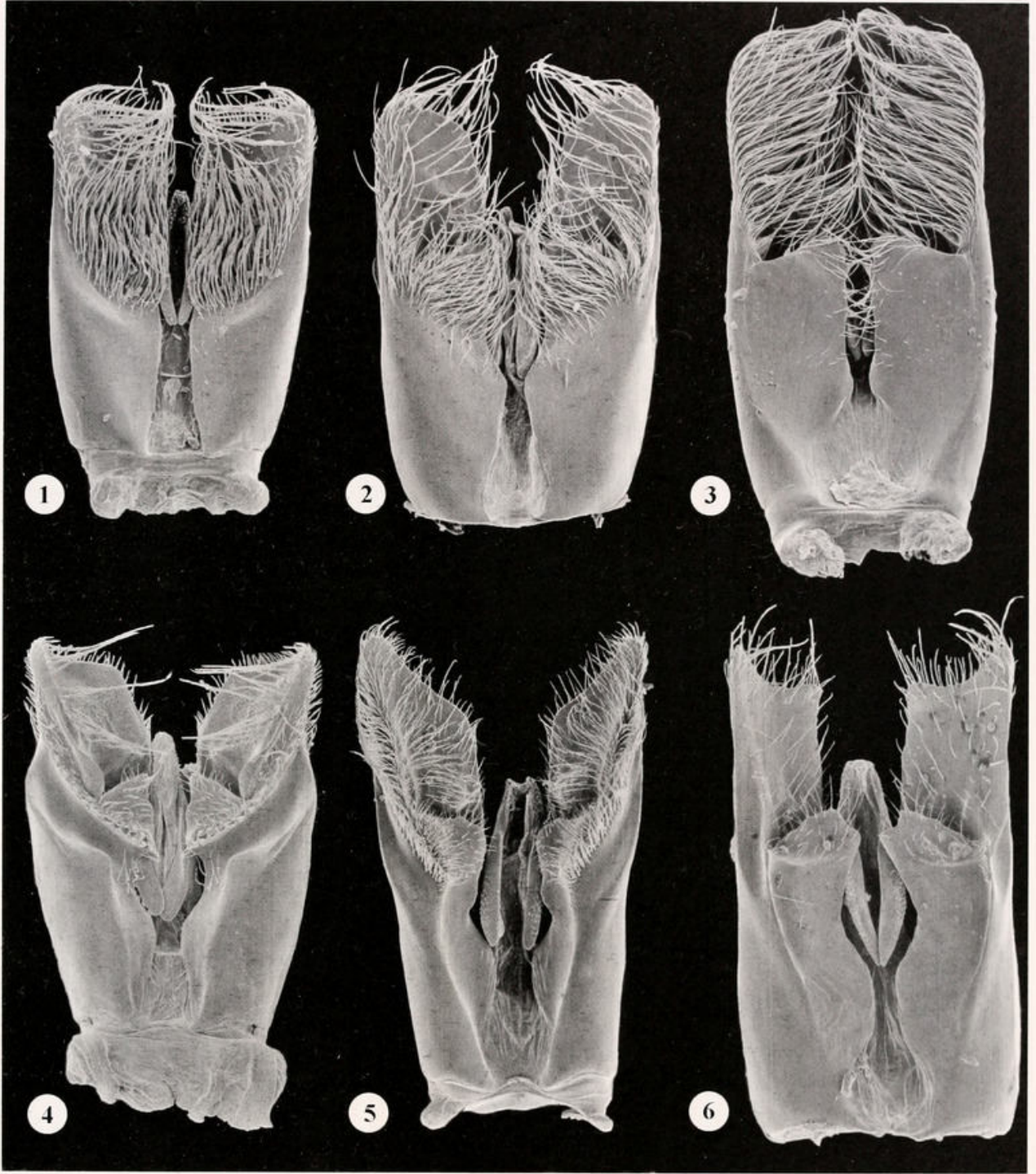
and frons carinate, shiny, with small, well separated punctures and smooth interstices. Propodeum laterally with long, anteriorly directed, narrow, sinuous slit; median part of propodeum postero-laterally markedly produced into lamella. Male genitalia as in Fig. 2.

Description.—**Female:** Black. The following are yellowish-white: spot on upper half of clypeus between converging arms of M-shaped carina; streak margining inner orbit from immediately above end of frontal carina to level of lateral ocellus; spot on humeral angle and narrow band (widened medially) along hind margin of pronotum; elongate spot anteriorly on mesopleuron; tegula anteriorly and posteriorly; in some specimens small spot medially on scutellum and narrow streak on metanotum laterally; posterior two-thirds of lateral propodeal lamella; lateral and medial transverse markings posteriorly on terga I – V; medial round spot on tergum VI.

Specimens from the north of the species' range differ markedly from those from the south in having the black largely replaced by reddish brown, all specimens, however, having the mandible and antenna light reddish-brown.

In the southern, melanistic specimens the following are dark reddish brown: ill-defined area anterior to yellowish-white posterior band on pronotum, tegula medially; extreme apex of scutellum, metanotum medially; diffuse patches between pale markings posteriorly on terga I and II; tibiae and tarsi.

In northern specimens the following are light reddish-brown: labrum; in some specimens diffuse area on clypeus surrounding pale spot, diffuse area on frons medially between arms of V-shaped carina and diffuse area on vertex behind eye; pronotum (other than for pale markings); in some specimens an ill-defined, posteriorly directed, V-shaped marking medially and a lateral marking posteriorly on mesonotum; upper half of mesopleuron



Figs 1-6. *Celonites* species. Ventral view of male genitalia ($\times 50$). 1, *C. heliotropii*. 2, *C. pulcher*. 3, *C. michaelsoni*. 4, *C. kalahariensis*. 5, *C. tumidiscutellatus*. 6, *C. arenarius*.

(other than for pale anterior spot); tegula medially; entire scutellum and metanotum (other than for pale markings sometimes present); median part of propodeum entirely or partially (sometimes only posterior lamella); metasoma (other than for pale markings listed above), black de-

clivity of tergum I and narrow black anterior transverse bands (usually hidden) on terga II - VI; femora, tibiae and tarsi of all legs.

Wings browned in all specimens.

Length 7.2-7.9 mm (average of 6: 7.5 mm); length of front wing 5.3-6.0 mm

(average of 6: 5.5 mm); hamuli 7–9. Length of extended tongue 5.6–5.8 mm; tongue length:body length = 0.74.

Head $1.4\times$ as wide as long (measured across eyes and from vertex to bottom of emargination of clypeus respectively). Clypeus and frons shiny, with small well separated punctures and smooth interstices; vertex dull, rugoso-punctate. Clypeus at mid-height with well-defined, smooth, widely and shallowly M-shaped carina and below it on each side with subtransverse, unpunctured, subcarinate swelling; surface of clypeal disc above M-shaped carina raised, especially laterally, below M-shaped carina (that is between it and subcarinate swelling) concave. Frons with conspicuous, smooth, widely and shallowly V-shaped carina (its arms somewhat sinuous) arising on each side opposite but outside middle of ocular sinus and meeting medially at obtuse angle at level of upper margin of antennal sockets; surface of frons falling very steeply from carina to antennal sockets and medially overhanging clypeal base.

Pronotum, mesopleuron, mesoscutum, scutellum and mesodorsal part of propodeum more coarsely sculptured than head, markedly longitudinally reticulate-punctate. Scutellum low, gently convex, gradually rising from mesoscutum. Tegula unusually long (circa $2.3\times$ as long as maximum width), posteriorly hardly narrowed, evenly curved. Propodeum with declivity finely punctured; with postero-lateral flange of median part finely imbricate, lateral lamella on each side with a few large punctures. Lateral lamella of propodeum at an angle to adjacent median part, with its outer margin gently convex, its inner margin emarginate in distal half, its apex rounded, separated from expanded postero-lateral flange of median part by narrow, sinuous, anteriorly directed slit (Fig. 22).

Terga with punctures smaller than those on thorax and with interstices micro-

sculptured yet moderately shiny; postero-lateral angles minimally produced; hind margins entire (non-crenulate).

Male: Both males examined are dark and similar in coloration to the southern females. The yellowish-white facial markings are slightly different from those of the female: that on the clypeus is larger, there is a marking on each arm of the frontal carina, and the marking near the eye fills the sinus rather than margining the upper inner orbit.

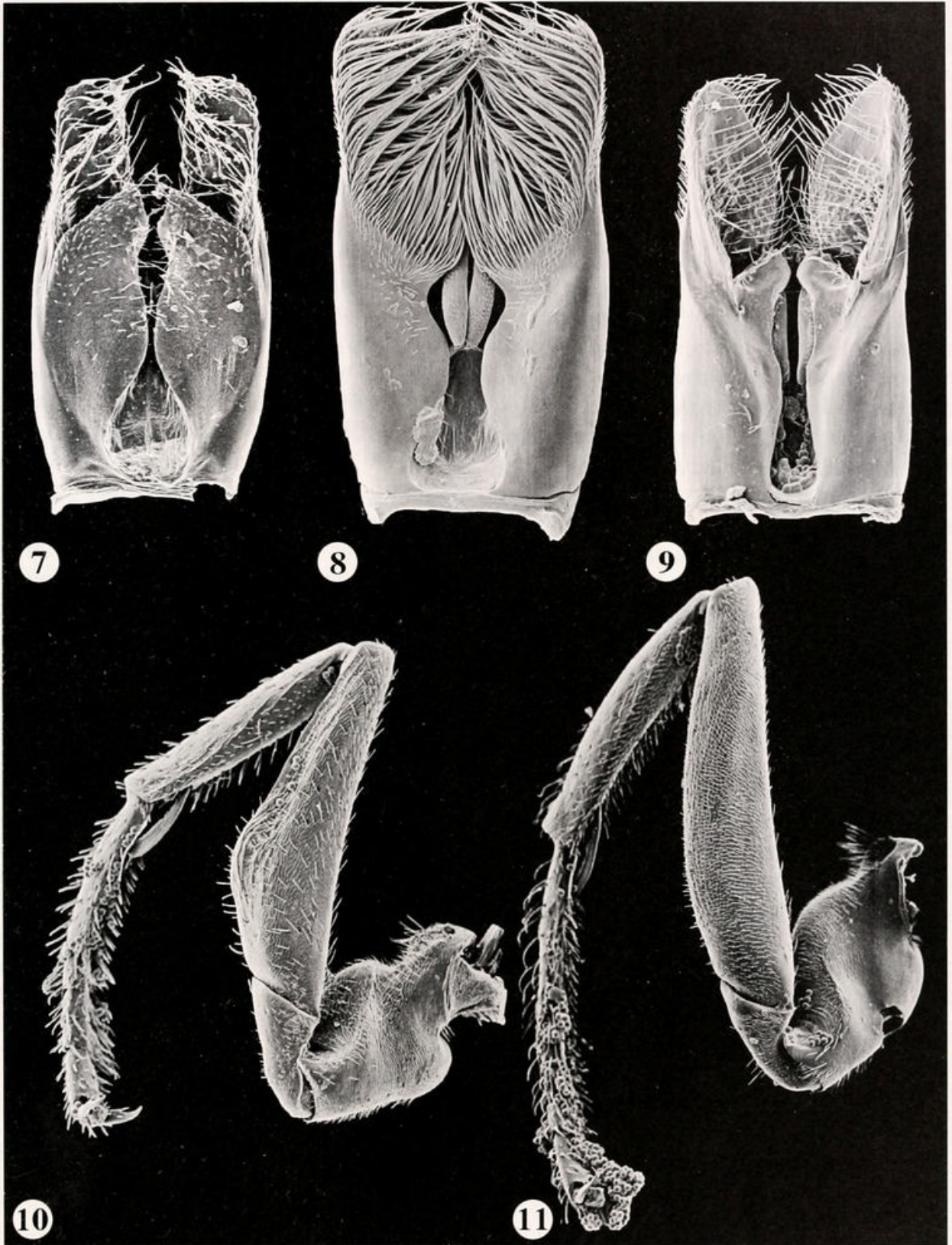
Length 7.5–7.7 mm; length of front wing 5.1–5.2 mm; hamuli 7 or 8. Length of extended tongue 5.3 mm.

More gracile than female but structurally similar, differing most noticeably in the partial effacement of the clypeal carina, the reduction of the frontal carina, the more markedly swollen antennal club and the more pronounced postero-lateral angles of the terga.

Genitalia in ventral view as in Fig. 2; in dorsal view with posterior margin of each paramere concave from rounded inner posterior angle to protruding, slightly incurved and pointed outer (lateral) posterior angle.

Etymology.—The name *pulcher*, a Latin adjective meaning beautiful, refers to the strikingly colourful appearance of the species.

Material examined.—Holotype: ♀, **NAMIBIA:** 57 km W of Keetmanshoop on road to Aus (26.46S 17.43E), 4.iii.2000 (F. W. and S. K. Gess) (visiting purple flowers of *Anticharis scoparia* (E. Mey. ex Benth.) Hiern ex Schinz, Scrophulariaceae) [AMG]. Paratypes: **NAMIBIA:** Two Palms, near Palmwag (19.53S 13.54E), 28.iii.2004, 1 ♀, 1 ♂ (visiting purple/violet flowers of *Anticharis inflata* Marloth & Engl., Scrophulariaceae); 120 km from Khorixas on road to Palm (20.17S 14.05E), 8.iv.1998, 6 ♀♀ (visiting purple/violet flowers of *Anticharis inflata*); 57 km W of Keetmanshoop on road to Aus (26.46S 17.43E), 4.iii.2000, 1 ♀, 1 ♂ (visiting purple flowers of *Anticharis scoparia* (E. Mey. ex Benth.) Hiern ex Schinz) – (all F.W. and S. K. Gess) [AMG].



Figs 7-11. *Celonites* species. Figs. 7-9. Ventral view of male genitalia ($\times 50$). 7, *C. andrei*. 8, *C. capensis*. 9, *C. chypeatus*. Figs. 10-11 Left fore leg of female. 10, *C. heliotropii* ($\times 50$). 11, *C. michaelsoni* ($\times 40$).

Geographic distribution.—(Fig. 13): Known from northern Namibia from two localities in the Mopane Savanna of Giess (1971) and from southern Namibia from one locality in the Dwarf Desert Savanna.

Floral associations.—Scrophulariaceae: Aptosimeae (*Anticharis* spp.)

Celonites kalahariensis Gess, new species

Diagnosis.—Both sexes relatively small (6.3–8.3 mm); black, with pronotum, mesopleuron, tegula, axilla, scutellum, metanotum, propodeum and gaster largely light reddish brown (male generally and in part more melanistic); clypeus and frons with carinae (that of clypeus incomplete medially and in male less pronounced than in female); sculpture (particularly in female) of frons below carina and of raised disc of clypeus (particularly below carina of each side) markedly subcostulate-punctate with raised lineations on each side running obliquely ventro-medially. Meso- and metapleura with pronounced, postero-ventrally directed, apically rounded, processes (situated below base of lateral lamella of propodeum). Male genitalia as in Fig. 4.

Description.—**Female:** Black. The following are yellowish white: in most specimens dorsal surface of propodeal lamella postero-laterally; ill defined and diffuse patches postero-laterally on terga I – III. The following are light reddish brown: all but extreme base of mandible; in some specimens and to a varying extent labrum, distal margin of clypeus and supracarinal marking on same, supracarinal marking on frons, narrow streak behind eyes dorsally; proximal flagellomeres and underside of club; entire pronotum; extensive area of mesopleuron; tegula; small area postero-medially on mesoscutum (in some specimens expanded to cover most of mesoscutum, in others not present); axilla; entire scutellum; metanotum; most of dorsal surface and declivity of propodeum; most of terga; underside of front femur; apex of

mid and hind femora; entire tibia and tarsi of all legs. Wings dark.

Length 6.7–8.3 mm (average of 10: 7.3 mm); length of front wing 4.3–5.3 mm (average of 10: 5.1 mm); length of extended tongue 4.4–5.8 mm (average of 3: 4.8 mm); hamuli 8 to 10 (most commonly 9).

Head 1.3× as wide as long (measured across eyes and from vertex to bottom of emargination of clypeus respectively). Clypeus below each antennal socket raised and with an inwardly curved carina (carinae not produced medially and therefore not meeting each other). Frons with well-developed, widely and shallowly V-shaped carina arising on each side opposite but outside middle of ocular sinus and meeting medially at acute angle at level of upper margin of antennal sockets. Frons above carina and vertex coarsely reticulate-punctate; frons below carina and raised disc of clypeus (particularly below carina of each side) markedly subcostulate-punctate with raised lineations on each side running obliquely ventro-medially.

Pronotum, mesopleuron, mesoscutum, scutellum and propodeum mesodorsally less coarsely sculptured than vertex, longitudinally reticulate-punctate. Scutellum rising abruptly from mesoscutum, medially somewhat swollen, slightly anteriorly produced and laterally subcarinate. Tegula circa 1.8× as long as maximum width, posteriorly narrowed with outer margin curving inwards towards rounded but acute posterior angle. Meso- and metapleura with pronounced, postero-ventrally directed, apically rounded, processes (situated below base of lateral lamella of propodeum).

Propodeum with declivity subcostulate and with lateral lamella of each side finely, closely and deeply punctured. Lateral lamella of propodeum broad, in same plane as adjacent median part, its outer margin gently curved and apex truncate, separated from median part by

narrow incurved slit (Fig. 24). Terga more finely and closely punctured than thorax; interstices microsculptured; postero-lateral angles minimally produced; hind margins entire (that is non-crenulate).

Male: Similar in coloration to female but generally more melanistic. Antennae entirely black; markings on head reduced, at most consisting of transverse band at base of clypeus.

Length 6.3–7.6 mm (average of 6: 6.7 mm); length of front wing 4.7–5.3 mm: 4.8 mm); length of extended tongue 4.2–5.4 mm (average of 5: 4.7 mm); hamuli 8–9 (most commonly 8).

More gracile than female but structurally similar, apart from usual more markedly swollen antennal club, less pronounced clypeal carinae, and differently formed postero-lateral angles of the terga (more produced, upwardly bent, laterally curved and apically roundly acute).

Genitalia in ventral view as in Fig. 4.

Etymology.—The name, a Neolatin adjective, is derived from Kalahari and is intended to indicate the provenance of the species.

Material examined.—Holotype: ♀, **NAMIBIA:** 71 km E of Stampriet on road to Aranos (24.09S 19.00E), 27.iii.2000 (F. W. and S. K. Gess) (visiting purple/violet flowers of *Aptosimum procumbens* (Lehm.) Steud., Scrophulariaceae) [AMG]. Paratypes: **NAMIBIA:** Gobabis [22.27S 18.58E], v.1973 (R. Bayliss), 1 ♂ [AMG]; Onse Rust 192 (24.09S 18.02E), 17-18.v.1973 [C. F.] Jacot-Guillarmod, 1 ♀, 1 ♂ [AMG]; 71 km E of Stampriet on road to Aranos (24.09S 19.00E), 27.iii.2000, 1 ♀, 4 ♂♂ (visiting purple/violet flowers of *Aptosimum procumbens* (Lehm.) Steud., Scrophulariaceae); same locality, 28.iii.2000, 3 ♀♀ (1 ♀ visiting purple/violet flowers of *Aptosimum procumbens*; 1 ♀ on ground next to *Aptosimum*; 1 ♀ at hole in sand near *Aptosimum*); 24 km E of Stampriet on road to Aranos (24.14S 18.35E), 1.iv.2000, 1 ♀ (visiting purple/violet flowers of *Aptosimum procumbens*); 19 km E of Stampriet on road to Aranos (24.15S 18.33E), 1.iv.2000, 3 ♀♀, 1 ♂ (visiting purple/violet flowers of *Aptosimum procum-*

bens); 2 km from C17 on R511 road to Mata Mata (25.37S 19.25E), 7.iii.2000, 1 ♀ (on ground near *Aptosimum procumbens*); same locality, 8.iii.2000, 2 ♂♂ (on ground near *Aptosimum procumbens*) – (all F. W. and S. K. Gess) [all AMG]. **SOUTH AFRICA:** NORTHERN CAPE: 123 km N of turnoff from N10 on R360 from Upington to Kgalagadi Park (27.30S 20.48E), 5.iv.2000 (F. W. and S. K. Gess), 1 ♀, (visiting purple/violet flowers of *Aptosimum procumbens*) [AMG].

Geographic distribution.—(Fig. 14): Known only from eastern and south-eastern Namibia in the Camelthorn Savanna (Central Kalahari) and the Mixed Tree and Shrub Savanna (Southern Kalahari) of Giess (1971) and from the trans-Orange part (Gordonia) of the Northern Cape of South Africa. All collecting sites were on the red dunes of the Kalahari.

Floral associations.—Scrophulariaceae: Aptosimeae (*Aptosimum procumbens*).

Discussion.—*C. kalahariensis* is similar to *C. tumidiscutellatus* but may be distinguished by the following characters. In the female: the sculpture on the clypeus is more noticeably obliquely orientated towards the midline; the frons, midway between the V-shaped carina and the anterior ocellus is less noticeably raised; the scutellum is more abruptly and steeply raised anteriorly above the level of the mesoscutum but is less swollen medially. The distribution of reddish-brown is more extensive: notable are the frequent presence of red facial markings; the extensive red area on the mesopleuron; the entirely red scutellum; the presence of red on the propodeum; the mostly red terga; and the more extensive red on the legs.

In the male the produced postero-lateral angles of the terga are wider, more rounded and less sharply pointed apically, in consequence the hind margin of tergum VII is bi-sinuate rather than rounded. The most notable difference between the two species is in the male genitalia – compare those of *C. kalahariensis* (Fig. 4) with those of *C. tumidiscutellatus* (Fig. 5).

Celonites arenarius Gess, new species

Diagnosis.—Both sexes relatively large (7.6–10.0 mm long); black, with pronotum, tegula, terga dark reddish brown; clypeus and frons without carinae. Scutellum steeply raised anteriorly, markedly longitudinally depressed medially. Hind margins of terga markedly crenulate. Male genitalia as in Fig. 6.

Description.—**Female:** Black. The following are dark reddish brown: distal half of mandible; upper surface of pronotum; tegula; narrow posterior margin of scutellum; median part of metanotum; terga I and II (except for triangular black antero-medial areas); terga III and IV laterally and posteriorly; tergum V postero-medially; "knees" of all legs; underside of mid and hind tibiae and tarsi of these legs. Wings browned.

Length 8.8–10.0 mm (average of 6: 9.4 mm); length of front wing 6.6–6.8 mm (average of 4: 6.7 mm); length of extended tongue 5.4–5.8 mm (average of 2: 5.6 mm); hamuli 8 or 9.

Head 1.3× as wide as long (measured across eyes and from vertex to bottom of emargination of clypeus respectively), totally devoid of clypeal and frontal carinae. Clypeal disc convex, steeply raised laterally, with surface closely reticulate punctate and with microsculptured interstices; frons, vertex and occiput slightly more coarsely reticulate punctate. Frons slightly raised above and between antennal sockets and very slightly depressed medially above swollen area.

Pronotum, mesonotum, mesopleuron, scutellum, posterior two thirds of tegula and dorso-lateral part of propodeum somewhat more coarsely punctured than frons. Scutellum steeply raised above level of postero-medially depressed mesoscutum, medially markedly longitudinally depressed. Tegula long (circa 2.2× as long as maximum width), posteriorly narrowed with outer margin curving inwards towards rounded but acute posterior angle.

Propodeal declivity finely longitudinally rugoso-punctate. Lateral lamella of propodeum broad, its surface with large punctures and shiny interstices, its outer margin minimally curved and its apex truncate, separated from median part by an incurved slit. Terga coarsely and closely punctured; postero-lateral angles produced, acutely pointed; hind margins markedly crenulate.

Male: Coloration identical to that of female

Length 7.6–8.8 mm (average of 4: 8.1 mm); length of front wing 5.4–6.6 mm (average of 4: 5.8 mm); hamuli 6 to 8.

More gracile than the female but structurally similar, apart from the more markedly swollen antennal club and the more produced, very acutely pointed postero-lateral angles of the terga. Hind margins of terga even more markedly crenulate.

Genitalia in ventral view as in Fig. 6; paramere in dorsal view laterally subparallel, terminally markedly concave between produced, acutely pointed outer angle and subrightangular inner angle.

Etymology.—The name *arenarius*, a Latin adjective relating to sand, serves to characterize the substrate on which the species was collected.

Material examined.—Holotype ♀, **SOUTH AFRICA:** NORTHERN CAPE: Richtersveld, Pachtvlei [circa 7 km NE of Alexander Bay] (28.33S 16.34E), 15.ix.1996 (F. W. and S. K. Gess) (nesting in burrow in sand) [AMG]. Paratypes: **SOUTH AFRICA:** NORTHERN CAPE: Richtersveld, Pachtvlei [circa 7 km NE of Alexander Bay] (28.33S 16.34E), 15.ix.1996 (F. W. and S. K. Gess), 4 ♀♀, 4 ♂♂ (all basking on sand); same locality and collectors, 18.ix.1996, 1 ♀ (on sand) [AMG]

Geographic distribution.—(Fig. 15): Known only from the type locality, Pachtvlei, situated on fine wind-blown alluvial sand on the southern bank of the Orange about 7 km from its mouth.

Floral associations.—Unknown, no flower visiting having been observed. Pollen from

the excavated cell was identified as possibly that of *Lebeckia multiflorum* E. Mey. (Fabaceae: Papilionoideae) growing in the vicinity of the nest.

Celonites michaelsoni von Schulthess

Celonites Michaelsoni von Schulthess, 1923: 137, male. Holotype: male, Namibia: Windhoek (Hamburg, destroyed in 1943 bombing). – Richards, 1962: 243 (speculation as to destruction of type).

Celonites michaelsoni von Schulthess. **Neotype**: male, Namibia: Otjitundu River, 42 km W of Okahandja (21.54S 16.31E) (AMG).

Celonites gariensis Gess, 1997: 41, female, male. Holotype: female, South Africa: Richtersveld National Park (AMG). **New synonym** – Gess (S. K.) et al., 1997: 75 (flower visiting, nesting); Gess and Gess, 2003: 38 (flower visiting).

Celonites michaelsoni von Schulthess 1923 was described from a single specimen collected by Dr W. Michaelson of the Hamburger deutsch-südwestafrikanischen Studienreise 1911 at Windhuk (now Windhoek in present day Namibia) during the period 29.iv. – 8.v.1911. The holotype, a male, was deposited in the Zoologisches Museum, Hamburg).

Richards (1962) omitted *C. michaelsoni* from his revisional study, speculating that “the type was probably at Hamburg and may well have been destroyed”. It is evident that he did not have access to any *Celonites* material from Namibia and therefore did not see any specimens answering to Schulthess’ description.

Recent collecting in Namibia, in particular that of F. W. and S. K. Gess during the period 1997–2004, has yielded a wealth of material of a common and widespread species which without any doubt is conspecific with *C. michaelsoni*. In common with some other species of wide distribution, a considerable variation is shown in the colour pattern; however, structural features, most importantly including the male genitalia, are constant across the range. The colour pattern exhibited by specimens from the north-central and

central part of Namibia, is that described by von Schulthess for the type from Windhoek.

Confirmation was received in 2005 from Dr Rudolf Abraham of the Zoologisches Museum, Hamburg that “we cannot find the type of *Celonites michaelsoni* in our collection, so it is indeed destroyed in 1943 during WW2”.

In view of the desirability of clarifying the taxonomic status of what appears to be the most common *Celonites* species occurring in Namibia, it is appropriate to designate a neotype for *C. michaelsoni*. The specimen chosen for this purpose is a male from a series of 5 ♀♀ and 3 ♂♂ from Otjitundu River, 42 km W of Okahandja (21.54S 16.31E), circa 90 km NW of Windhoek. The colour pattern is consistent with that of the destroyed holotype.

Celonites gariensis Gess 1997 is a synonym. The name was applied to specimens from the southern part of the species’ range, their true identity not being recognized at the time.

As already stated, *C. michaelsoni* shows a remarkable degree of colour variation across its range.

The most strikingly colored specimens, characterized by very clearly defined white lateral markings and orange-red postero-medial markings on the otherwise black terga, a white-marked black pronotum and an unmarked black mesopleuron occur in the north central part of Namibia (near Tsumeb; the Etosha National Park; between Outjo and Okaukuejo; between Omaruru and Kalkveld; between Omaruru and Karibib; and between Karibib and Okahandja).

Moving westwards there is a tendency at least for some specimens to have the terga and pronotum red rather than black but having the same markings and to have a white-marked black mesopleuron (26 km W of Kamanjab; 24 km N of Palmwag; 120 km from Khorixas on road to Palm; 40 km E of Springbokwater).

Further west still and in the Central Namib most specimens have the terga with red posterior bands which are unmarked or at most have white postero-medial markings; the pronotum and mesopleuron being generally black and unmarked (40 km E of Springbokwater; between Uis and Henties Bay; Solitaire; between Usakos and Swakopmund; Swakopmund District).

In south central and south-eastern Namibia specimens are similar to the last form but the red posterior bands have diffuse white markings both laterally and postero-medially and in some the pronotum is white marked (S. of Windhoek, Gaub bridge, E. of Hardap Dam; S. of Mariental, near Karasburg; between Karasburg and Ariamsvlei).

At the southern extremity of the species' range, that is in the Richtersveld (Northern Cape, South Africa) specimens are generally melanistic and are also somewhat smaller than those from more northern localities.

Specimens from two isolated localities in Limpopo (= Northern Province), South Africa, are similar to those from the savanna in northern Namibia.

Male genitalia in ventral view as in Fig. 3.

Material examined.—Neotype: ♂, **NAMIBIA**: Otjitundu River, 42 km W of Okahandja (21.54S 16.31E), 1 & 2.iv.2004 (F. W. and S. K. Gess) (visiting purple/violet flowers of *Aptosimum arenarium* Engl., Scrophulariaceae) [AMG]. Other specimens: **NAMIBIA**: 26 km W of Kamanjab (19.36S 14.28E), 7.iv.1998, 7 ♀♀, 2 ♂♂ (visiting purple/violet flowers of *Aptosimum angustifolium* Weber & Schinz, Scrophulariaceae); 24 km N of Palmwag (19.43S 13.51E), 18.iii.1999, 3 ♀♀ (2 visiting purple/violet flowers of *Anticharis inflata* Marloth & Engl., Scrophulariaceae; 1 visiting blue/violet flowers of *Aptosimum angustifolium*); 27 km NW of Outjo on road to Okaukuejo (19.44S 15.53E), 26.iii.1997, 1 ♂ (visiting purple flowers of *Aptosimum decumbens* Schinz); Two Palms, near Palmwag (19.53S 13.54E), 28.iii.2004, 1 ♂ (visiting white flowers of *Heliotropium tubulosum* E. Mey. ex DC., Boraginaceae); 120 km from Khorixas on road

to Palm (20.17S 14.05E), 8.iv.1998, 1 ♀, 3 ♂♂ (1 ♀ and 1 ♂ visiting purple/violet flowers of *Anticharis inflata*; 2 ♂♂ visiting white flowers of *Boerhavia deserticola* Codd, Nyctaginaceae); 40 km E of Springbokwater (20.17S 13.57E), 11.iv.2002, 2 ♀♀ (visiting violet flowers of *Anticharis inflata*); Uis to Khorixas (20.54S 15.05E), 15.iii.2004, 1 ♀ (visiting purple-violet flowers of *Anticharis*); 24 km N of Omaruru on road to Kalkveld (21.15S 16.01E), 23.iii.1997, 29 ♀♀ (28 ♀♀ visiting purple flowers of *Aptosimum arenarium* Engl.); 156 km from Khorixas, betw. Uis and Henties Bay (21.24S 14.46E), 9.iv.1998, 2 ♀♀, 1 ♂ (visiting purple/violet flowers of *Anticharis ebracteata* Schinz); 20 km S of Omaruru on road to Karibib (21.35S 15.59E), 23 and 24.iii.1997, 5 ♀♀, 1 ♂ (3 ♀♀ visiting purple flowers of *Aptosimum arenarium*; 2 ♀♀, 1 ♂ on ground next to this plant); 30 km S of Omaruru on road to Karibib (21.41S 15.59E), 26.iv.2002, 5 ♀♀, 3 ♂♂ (visiting bluish violet flowers of *Aptosimum arenarium*); Karibib to Omaruru (21.51S 15.55E), 12.iii.2004, 1 ♂; Otjitundu River, 42 km W of Okahandja (21.54S 16.31E), 1 & 2.iv.2004, 5 ♀♀, 2 ♂♂ (visiting purple/violet flowers of *Aptosimum arenarium*); 72 km E of Karibib on road to Okahandja (21.54S 16.31E), 1.iv.1998, 1 ♀, 2 ♂♂ (visiting purple flowers of *Aptosimum arenarium*); 94 km E of Karibib on road to Okahandja (21.57S 16.43E), 1.iv.1998, 1 ♀ (visiting purple/violet flowers of *Aptosimum arenarium*); 77 km E of Henties Bay on road to Klein Spitzkuppe (21.54S 14.58E), 19.iv.2002, 1 ♀ (visiting white flowers of *Heliotropium tubulosum*); 58 km SW of Usakos on road to Swakopmund (22.12S 15.10E), 23.iv.2002, 2 ♀♀ (1 ♀ visiting violet flowers of *Aptosimum spinescens* (Thunb.) Weber; 1 ♀ on ground next to this plant); 7 km from Gaub bridge towards Kuiseb River (23.27S 15.48E), 14.iv.1998, 7 ♀♀ (visiting purple/violet flowers of *Aptosimum lineare* Marloth & Engl.); Solitaire (23.52S 16.00E), 30.iv.2002, 3 ♀♀, 2 ♂♂ (visiting purple/violet flowers of *Aptosimum spinescens*); E of Hardap Dam (24.29S 17.53E), 4.iv.1997, 1 ♀, 1 ♂ (visiting purple flowers of *Aptosimum glandulosum* Weber & Schinz); 25 km S of Mariental (24.50S 17.56E), 16.iv.1998, 2 ♀♀ (visiting purple/violet flowers of *Aptosimum spinescens*); S of Maltahöhe on D811 (25.16S 17.03E), 23.iii.1999, 1 ♂ (visiting purple/violet flowers of *Aptosimum spinescens*); Klein-Aus-Vista (26.41S 16.13E), 23.ix.2003, 4 ♀♀, 3 ♂♂ (visiting purplish violet flowers of *Aptosi-*

mum tragacanthoides E. Mey. ex Benth.); circa 3 km NNW of Karasburg (27.58S 18.43E), 6.iii.1999, 1 ♀ (visiting purple flowers of *Aptosimum spinescens*); between Karasburg and Ariamsvlei (28.05S 19.25E), 18.iv.1998, 1 ♀ (ex nest) – (all F. W. and S. K. Gess) [all AMG]; 10 km SE of Tsumeb [19.17S 17.48E], 8.iii.1990, 1 ♂; 62 km E of Karibib [21.53S 16.25E], 20.ii.1990, 1 ♀, 4 ♂♂; 17 km W of Okahandja [21.57S 16.44E], 19.ii.1990, 1 ♂; 28 km S of Windhoek [22.49S 17.08E], 17.ii.1990, 2 ♂♂ – (all W. J. Pulawski) [all CAS]; Etosha Nat.Park, Nau-Obes (19.19S 16.37E), 17.i.1987 (J. Irish, E. Marais) 2 ♀♀; Damaraland, 6 km N Arandis (22.22S 14.59E), 1.iii.- 9.iv.1985, 1 ♀, 9.iv.- 6.v.1985, 1 ♀ (both J. Irish, H. Rust); Swakopmund Dist., Rössing Mine (22.28S 15.02E), 8.v.- 5.vi.1984 (J. Irish, H. Liessner), 1 ♀; Swakopmund Dist., Lower Ostrich Gorge (22.30S 14.58E), 5.vi.- 3.vii.1984 (J. Irish, H. Liessner), 1 ♀; Hoogland 132, Maltahöhe (SE2416Cd) [24.45S 16.15E], 1-3.ii.1974, 1 ♀; Vogelstraußkluft 87, Bethanien (SE2717Ba) [27.00S 17.31E], 24-29.ix.1974 (? collector), 1 ♂ – [all NNIC]. **SOUTH AFRICA:** LIMPOPO (formerly NORTHERN PROVINCE): Louis Trichardt (2239BB sic!!) [23.03S 29.55E], 27.vi.1991 (M. Lorenz), 1 ♀; Rust de Winter Dam [25.15S 28.29E], 12.x.1980 (F. J. Herbst), 1 ♀, 1 ♂ [all AMG]; NORTHERN CAPE: Namaqualand, Richtersveld National Park, Koeroegabvlakte (28.11S 17.03E), 17-21 and 24.ix.1995, holotype ♀, 33 paratype ♀♀, 4 paratype ♂♂ of *C. garipeensis* Gess (33 ♀♀ incl. holotype, 3 ♂♂ in deep violet flowers of *Peliostomum* sp., Scrophulariaceae; 1 ♀, 1 ♂ in purple-violet flowers of *Aptosimum spinescens*); same locality, 6.ix.1996, 1 paratype ♀, 7 paratype ♂♂ of *C. garipeensis* (♀, 6 ♂♂ on ground near flowering *Peliostomum* sp.); Namaqualand, Richtersveld National Park, Paradise Kloof (28.19S 17.01E), 22.ix.1995, 1 paratype ♀ of *C. garipeensis* (associated with nest); Namaqualand, Richtersveld National Park, 1.5 km from Helskloof gate (28.18S 16.57E), 8 and 9.ix.1996, 3 paratype ♀♀, 1 paratype ♂ of *C. garipeensis* (all on ground near *Aptosimum spinescens*) – (all F. W., S. K. and R. W. Gess) [all AMG].

Geographic distribution.—(Fig. 16): Known in Namibia from collection localities spanning ten degrees of latitude in the Mopane Savanna, Saline Desert with Dwarf Scrub Savanna Fringe, Mountain Savanna and Karstveld, Thornbush Savanna, Central Namib, Semi-desert and Savanna Transi-

tion, Highland Savanna, and Dwarf Scrub Savanna of Giess (1971). In South Africa it is known from the Richtersveld National Park (Northern Cape) in the Namaqualand Broken Veld of Acocks (1953) and from two localities in Limpopo in the Mixed Bushveld of Acocks.

Floral associations.—Scrophulariaceae: Aptosimeae (*Anticharis* spp., *Aptosimum* spp., *Peliostomum* sp.).

Known species of *Celonites* not previously recorded from Namibia.

Celonites andrei Brauns

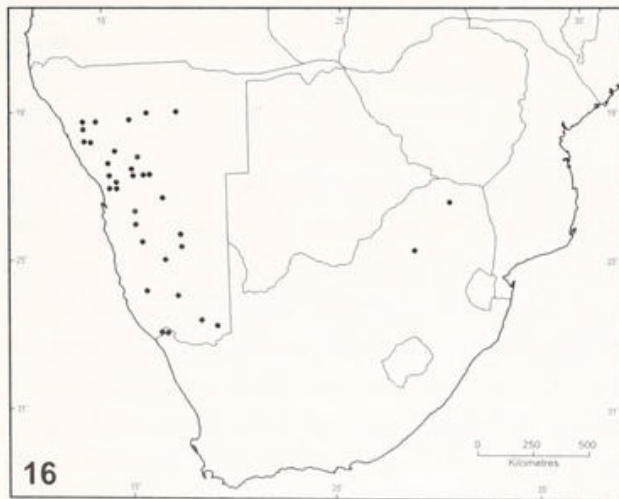
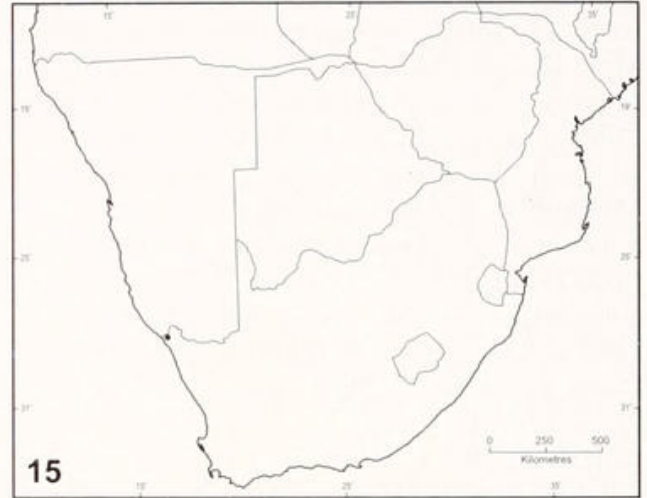
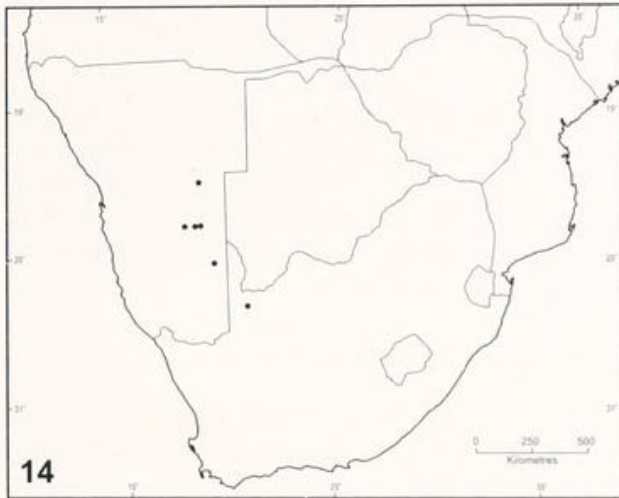
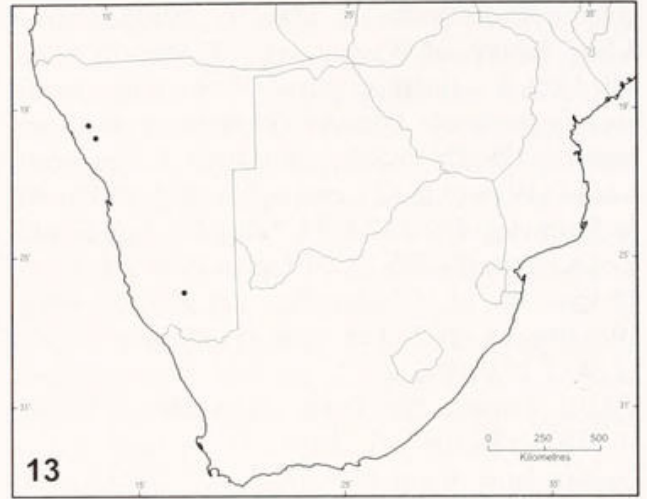
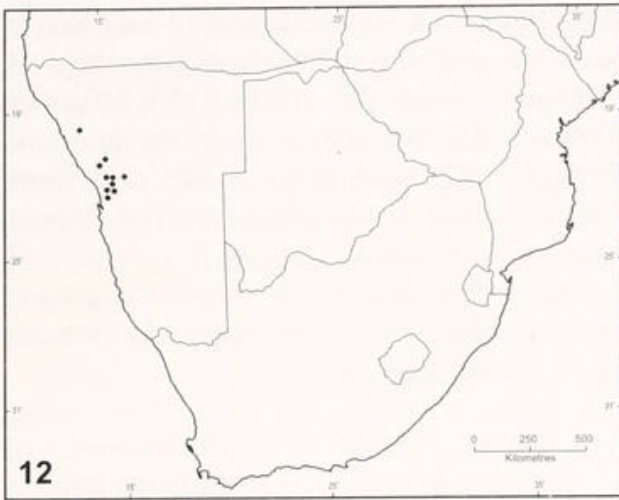
Celonites andrei Brauns, 1905: 228, female. Holotype: female, South Africa : Willowmore (TMP). – Brauns, 1913: 206, male, female, nest; Richards, 1962: 236 (revision); Gess, 1996: 222 (flower visiting); Gess and Gess, 2003: 36 (flower visiting).

Male genitalia (Fig. 7)

Material examined.—**NAMIBIA:** Sperrgebiet (Diamond Area 1): Tsaukhaib (26.43S 15.40E), 13 and 15.ix.2005 (F. W. and S. K. Gess), 1 ♀, 2 ♂♂ (both sexes associated with *Aptosimum spinescens* (Thunb.) Weber, Scrophulariaceae, flying around plants, alighting on ground next to them, ♀ observed entering a flower).

Geographic distribution.—(Fig. 17): Known in Namibia from a single locality on the old wagon track from Lüderitz to Aus, in the north of Diamond Area 1 in the Desert and Succulent Steppe (Winter rainfall area) of Giess (1971). It is widely distributed in the Karoo Biome of South Africa, specimens in the Albany Museum collection being from the Northern Cape (Twee Rivieren in the Kalahari Gemsbok National Park, the Richtersveld National Park, Aenous, Springbok, and near Norvalspont), from the Western Cape (near Prince Albert) and from the Eastern Cape (Steytlerville).

In South Africa, as in Namibia, the species has been recorded visiting flowers solely of Scrophulariaceae: Aptosimeae (*Aptosimum procumbens* (Lehm.) Steud., *A.*



Figs 12–17. *Celonites* species. Distributions. 12, *C. heliotropii*. 13, *C. pulcher*. 14, *C. kalahariensis*. 15, *C. arenarius*. 16, *C. michaelsoni*. 17, *C. andrei*.

spinescens (Thunb.) Weber, and *Peliosotomum virgatum* E. Mey. ex Benth.)

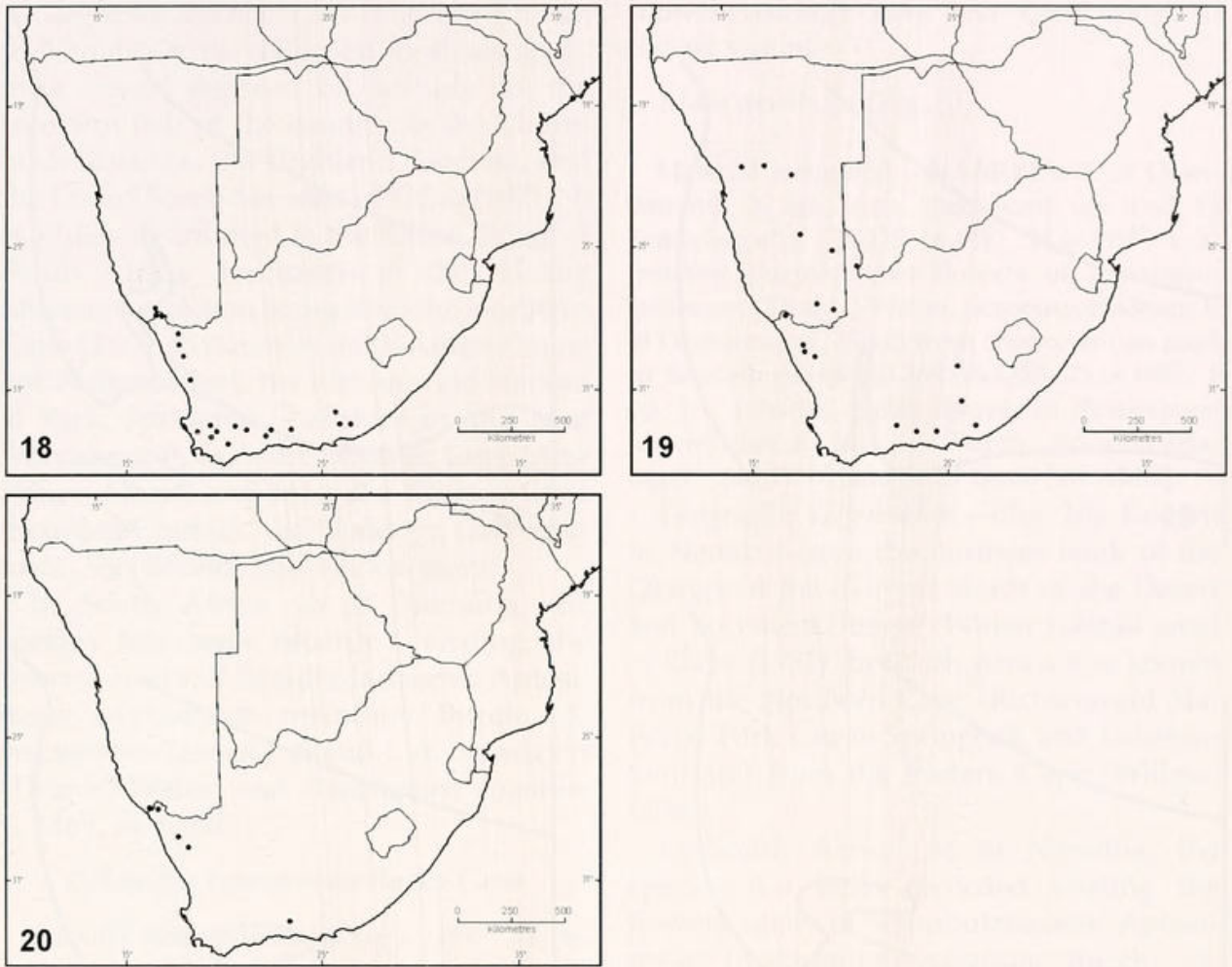
Celonites capensis Brauns

Celonites capensis Brauns, 1905: 231, female. Holotype: South Africa: Willowmore (TMP). –

Brauns, 1913: 205, male; Richards: 1962: 235 (revision); Gess, 1996: 223 (flower visiting); Gess and Gess, 2003: 37 (flower visiting).

Male genitalia (Fig. 8)

Material examined.—**NAMIBIA**: 16 km S of Rosh Pinah (28.04S 16.51E), 13–15.x.2000, 24 ♀♀



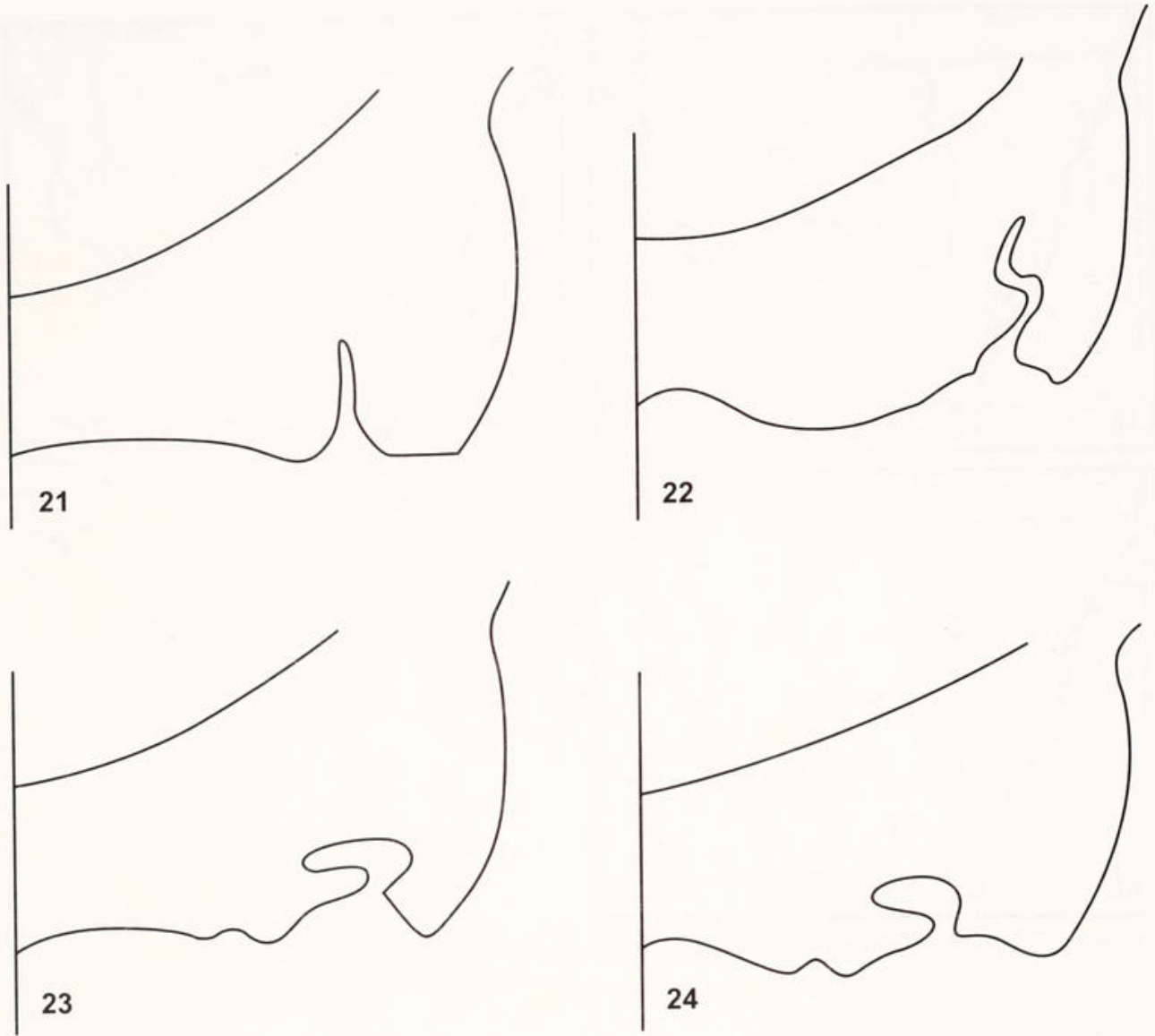
Figs 18–20. *Celonites* species. Distributions. 18, *C. capensis*. 19, *C. clypeatus*. 20, *C. tumidiscutellatus*.

(14 ♀♀ visiting yellow flowers of *Tripteris microcarpa* Harv., Asteraceae; 3 ♀♀ visiting yellow flowers of *Gazania lichtensteinii* Less., Asteraceae; 3 ♀♀ visiting yellow flowers of *Didelta carnosa* (L.f.) Ait., Asteraceae; 4 ♀♀ visiting pinkish white flowers of Aizoaceae: *Mesembryanthema*) – (all F. W. and S. K. Gess) [all AMG]; Diamond Area 1, Daberas (28.12S 16.49E), 14–29.ix.1994 (E. Marais) 1 ♀ (Pres. pitf. traps) [NNIC].

Geographic distribution.—(Fig. 18): Known in Namibia from two closely adjacent localities in the extreme south of the Desert and Succulent Steppe (Winter rainfall area) of Giess (1971). It is widely distributed in the Karoo Biome of South Africa, specimens, mostly in the Albany Museum collection, being from the Northern Cape (Richterveld, between Vioolsdrif and Springbok, Voëlkliip near Springbok, and Sors Sors near Kamie-

skroon), from the Western Cape (Nuwerus, near Ceres, Malmesbury, Ladismith, and near Oudtshoorn) and from the Eastern Cape (several localities near Grahamstown). Richards (1962) recorded the species from Worcester, Montagu and Matjesfontein in the Western Cape and from Willowmore and Somerset East in the Eastern Cape.

In South Africa the species has been recorded visiting the flowers of a wide range of plants: Asteraceae (*Berkheya* spp., incl. *Berkheya heterophylla* (Thunb.) O. Hoffm., and *Senecio pterophorus* DC.), Aizoaceae: *Mesembryanthema* (*Drosanthemum* sp. and *Prenia pallens* (Ait.) N. E. Br.), Geraniaceae (*Pelargonium myrrhifolium* (L.) L'Hérit.), Scrophulariaceae (*Phyllopodium cuneifolium* (L. f.) Benth.), Campanulaceae (*Wahlenbergia ecklonii* Buek), Irida-



Figs 21–24. *Celonites* species. Diagrammatic representations of postero-lateral part of propodeum. 21, *C. capensis*. 22, *C. pulcher*. 23, *C. michaelsoni*. 24, *C. kalahariensis*.

ceae (*Ferraria* sp.), and Boraginaceae (*Ehretia rigida* (Thunb.) Druce).

Celonites clypeatus Brauns

Celonites clypeatus Brauns, 1913: 206, female. Holotype: South Africa: Willowmore (TMP). – Richards, 1962: 236 (revision); Gess, 1996: 223 (flower visiting); Gess and Gess, 2003: 38 (flower visiting).

Male genitalia (Fig. 9)

Material examined.—NAMIBIA: 62 km E of Karibib [21.53S 16.25E], 20.ii.1990 (W. J. Pulawski), 3 ♀♀ [CAS]; 10 km W of Usakos on road to Swakopmund (21.59S 15.30E), 12 &

13.iii.2004, (F. W. and S. K. Gess), 2 ♀♀, 3 ♂♂ (visiting purple violet flowers of *Aptosimum arenarium* Engl., Scrophulariaceae) [AMG]; Excelsior 206, Windhoek (22.27S 17.38E), 1–31.viii.1979 (S. Louw, M.-L. Penrith), 1 ♂ [NNIC]; 25 km S of Mariental (24.50S 17.56E), 16.iv.1998, 3 ♀♀, 1 ♂ (visiting purple/violet flowers of *Aptosimum spinescens* (Thunb.) Weber); 2 km from C17 on R511 road to Mata Mata (25.37S 19.25E), 8.iii.2000, 1 ♀; circa 3 km NNW of Karasburg (27.58S 18.43E), 6.iii.1999, 2 ♀♀ (visiting purple flowers of *Aptosimum spinescens*); between Karasburg and Ariamsvlei (28.05S 19.25E), 18.iv.1998, 1 ♀ (visiting purple/violet flowers of *Aptosimum spinescens*) - (all F. W. and S. K. Gess) [all AMG];

Geographic distribution.—(Fig. 19): Known in Namibia from collection localities spanning seven degrees of latitude in the southern half of the country in the Thornbush Savanna, the Highland Savanna, and the Dwarf Scrub Savanna of Giess (1971). It is widely distributed in the Karoo Biome of South Africa, specimens in the Albany Museum collection being from the Northern Cape (Twee Rivieren in the Kalahari Gemsbok National Park, the Richtersveld National Park, Springbok, Leliefontein and near Norvalspont), from the Western Cape (near Prince Albert) and from the Eastern Cape (between Cradock and Hofmeyr, Grahamstown, Steytlerville and Willowmore).

In South Africa, as in Namibia, the species has been recorded visiting the flowers solely of Scrophulariaceae: *Aptosimeae* (*Aptosimum indivisum* Burch., *A. procumbens* (Lehm.) Steud., *A. spinescens* (Thunb.) Weber, and *Peliostomum virgatum* E. Mey. ex Benth.)

Celonites tumidiscutellatus Gess

Celonites tumidiscutellatus Gess, 1997: 44, female, male. Holotype: female, South Africa, [Northern Cape Province,] Namaqualand, Springbok, Hester Malan [now Goegap] Nature Reserve (AMG). – S. K. Gess et al., 1997: 76

(flower visiting); Gess and Gess, 2003: 40 (flower visiting).

Male genitalia (Fig. 5)

Material examined.—**NAMIBIA:** E of Oranjemund, 37 km from checkpoint on road to Sendelingsdrif (28.23S 16.44E), 24.ix.1997, 4 ♀♀ (visiting purple/violet flowers of *Aptosimum spinescens* (Thunb.) Weber, Scrophulariaceae); E of Oranjemund, 28 km from checkpoint on road to Sendelingsdrif (28.26S 16.42E), 25.ix.1997, 2 ♀♀, 1 ♂ (visiting violet flowers of *Peliostomum leucorrhizum* E. Mey. ex Benth., Scrophulariaceae) – (all F. W. and S. K. Gess) [all AMG].

Geographic distribution.—(Fig. 20): Known in Namibia from the northern bank of the Orange in the extreme south of the Desert and Succulent Steppe (Winter rainfall area) of Giess (1971). In South Africa it is known from the Northern Cape (Richtersveld National Park, near Springbok and Leliefontein) and from the Eastern Cape (Willowmore).

In South Africa, as in Namibia, the species has been recorded visiting the flowers solely of Scrophulariaceae: *Aptosimeae* (*Aptosimum indivisum* Burch., *A. procumbens* (Lehm.) Steud., *A. spinescens* (Thunb.) Weber, and *Peliostomum virgatum* E. Mey. ex Benth.)

KEY TO SPECIES OCCURRING IN NAMIBIA

- 1. Propodeum postero-laterally with long, anteriorly directed slit separating off lateral lamella from medial part of propodeum; slit straight or sinuous, not or only minimally incurved anteriorly (Figs 21, 22) 2
- Propodeum postero-laterally with anteriorly directed slit which after very short distance is incurved and ends in circular emargination or extends medially in transverse direction, in both conditions cutting off lateral lamella leaving part of hind margin of median part of propodeum as narrow finger-like process pointing towards end of lateral lamella (Figs 23, 24) 3
- 2. Propodeal slit narrow and straight (Fig. 21); lateral lamella distally broadly truncate, more or less in same plane as adjacent median part of propodeum. Neither clypeus nor frons with carina (though frons may have low swelling). Male genitalia: Fig. 8 *capensis* Brauns
- Propodeal slit narrow and sinuous (Fig. 22); lateral lamella distally narrowly and obliquely truncate, at angle to adjacent median part of propodeum; median part of propodeum postero-laterally markedly produced, lamellate (Fig. 22). Both clypeus and frons with carina (though clypeal carina may be weak or absent in male).

- Clypeus and frons shiny, with small, well separated punctures and smooth interstices; mesoscutum and scutellum markedly longitudinally reticulate-punctate. Male genitalia: Fig. 2 *pulcher* Gess n. sp.
3. Frons with V-shaped carina (sometimes weak medially); clypeus with an M-shaped carina (if medially weak and diffuse, at least well developed laterally) 4
- Frons without a V-shaped carina 8
4. Meso- and metapleura with pronounced, postero-ventrally directed, apically rounded, processes (situated below base of lateral lamella of propodeum). Pronotum, mesopleuron, tegula, axilla, scutellum, metanotum, propodeum and gaster largely red. In some specimens (particularly females) clypeus baso-medially and frons supra-carinally with transverse red markings. Male genitalia: Fig. 4. *kalahariensis* Gess n. sp.
- Meso- and metapleura without such processes 5
5. Mesopleuron with variously sized (to minute) red marking 6
- Mesopleuron either totally black or with white marking 7
6. Frons with small red (or yellow) spot on each side [in female situated next to upper margin of ocular sinus, that is, above carina; in male situated within lower half of ocular sinus, that is, below carina]. Clypeus of female occasionally with red spot, that of male usually with red or yellow spot. Carinae on frons and clypeus of female poorly developed medially, those of male even more poorly developed and almost effaced respectively. Scutellum falling abruptly onto mesoscutum (especially in female). Male genitalia: Fig. 7 *andrei* Brauns
- Frons without small red spot on each side in female but in male occasionally with red spot within lower half of ocular sinus. Clypeus of both sexes immaculate. Carinae on frons and clypeus of female well developed throughout, both carinae less developed but indicated in male. Scutellum falling gradually onto mesoscutum. Male genitalia: Fig. 9 *clypeatus* Brauns
7. Frons, clypeus and mesopleuron totally black, dorsal part of pronotum red, abdominal terga black with reddish posterior bands; scutellum medially raised (subconical) and anteriorly falling gradually onto mesoscutum (see Gess 1997: Fig. 9). Male genitalia: Fig. 5 *tumidiscutellatus* Gess
- Frons, clypeus and mesopleuron often with white spots, dorsal part of pronotum black with white humeral spots and white or yellow (to orange) hind margin, abdominal terga with reddish posterior bands and white lateral and medial spots; scutellum antero-medially almost overhanging mesoscutum and falling very abruptly onto it (see Gess 1997: Fig. 3). Male genitalia: Fig. 3 (See also Gess 1997: Figs 5 and 6) *michaelseni* von Schulthess
8. Fore femur (more particularly that of female) produced postero-ventrally in proximal half (Fig. 10). Pronotum, tegula, scutellum and posterior bands on terga red. Male with most of mandibles, entire labrum and clypeus and variably developed facial markings lemon yellow. Male genitalia: Fig. 1 *heliotropii* Gess n. sp.
- Fore femur unmodified. Hind margins of terga very markedly crenulate. Scutellum steeply raised anteriorly, markedly longitudinally depressed medially. Pronotum, tegula and terga (largely) red. Pale facial markings absent. Male genitalia: Fig. 6 *arenarius* Gess n. sp.

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