

**A NEW GENUS AND SPECIES OF TREE-CLIMBING CRAB  
(CRUSTACEA: BRACHYURA: SESARMIDAE) FROM TAIWAN WITH NOTES ON  
ITS ECOLOGY AND LARVAL MORPHOLOGY**

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**ABSTRACT.** – A new genus and species of sesarmid crab, *Scandarma lintou*, is described from Taiwan. This crab has a semi-terrestrial habit: adults and juveniles thrive in wind-protected and vegetated habitats in close vicinity of fresh water and up to one kilometer from the sea. In southern Taiwan, this species was most commonly found hiding in leaf axils or climbing on the thorny leaves of the screw pine *Pandanus odoratissimus* Linnaeus. During the reproductive season (June to January), ovigerous females migrate to estuaries, where small and free-swimming pelagic larvae are released into the brackish waters and probably washed into the sea. Morphologically, this species is superficially similar to species of other semi-terrestrial sesarmid genera, but differs from these taxa by the shape of the anterolateral carapace region, by the markedly flattened fingers, by the presence of a row of tubercles on the dorsal border of the dactylus, a row of ventral spines on the pollex, and a granular ridge on the dorsal face of the palm. The first zoeal stage of the new genus shows two autapomorphies in the morphology of antennae and first maxillipeds. Otherwise, this stage presents the combination of features that are typical of sesarmid zoeae, i.e. absence of lateral carapace spines, a 2,3 setation of the maxillar endopod, a 2,2,3,3 setation on the basis of the first maxilliped, and a characteristic setation pattern of antennae and telson.

**KEY WORDS.** – Sesarmidae, taxonomy, morphology, ecology, zoea larva.

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## INTRODUCTION

The brachyuran family Sesarmidae Dana, 1851, is known to comprise many genera of semi-terrestrial, terrestrial, and limnic crabs (Hartnoll, 1964; Ng & Davie, 1995; Ng & Tan, 1995; Schubart et al., 2000). These ecological terms are often used in the scientific literature and are meant to distinguish those crabs that spend part of their life cycle in the sea (semi-terrestrial) from those that are completely independent from the sea (terrestrial or limnic). However, the use of these terms is not consistent and crabs often referred to as “terrestrial”, like the Gecarcinidae, are actually semi-terrestrial, due to the fact that gravid females migrate to the sea for larval release, and the larvae undergo a typical marine planktonic development through several zoeal stages. Trying to establish a more consistent nomenclature, Schubart et al. (2000) introduced the following terms for describing non-marine life forms in decapod Crustacea: 1) adults terrestrial (e.g. *Cardisoma*), 2) adults limnic (e.g. *Eriocheir*), 3) entirely

inland (e.g. *Potamon*), where the first two groups comprise all the crabs that spend part of their life cycle in the sea and the third group includes all land dwellers that are completely independent from the sea. Among the land dwellers, it is often difficult to distinguish between a terrestrial and a limnic existence, because many of these crabs live in close vicinity of fresh water or have an amphibious life style (e.g. Schubart & Diesel, 1999).

All “entirely inland” crabs are characterized by producing large yolk-rich eggs and undergoing an abbreviated or a direct development. In the process of reconstructing phylogenetic relationships of thoracotreme crabs, Schubart et al. (2000) showed that among the Grapsoidea sensu Martin & Davis (2001) and Schubart et al. (2002) (consisting of the families Gecarcinidae, Glyptograpsidae, Grapsidae, Plagusidae, Sesarmidae, and Varunidae) only the Sesarmidae have representatives with large eggs (e.g. genera *Geosesarma*, *Metopaulias*, *Sesarma*) and thus include

entirely inland forms. Other adult terrestrial forms like *Geograpsus*, *Cardisoma*, and *Gecarcoidea*, or adult limnic forms like *Eriocheir*, *Varuna*, and *Platychoirapsus* have small eggs and thus spend the larval phase of their life cycle in the sea. However, also among the Sesarmidae we find several cases in which apparent land-dwelling forms have small eggs and return to the sea for larval release (Anger et al., 1990; Diesel & Schuh, 1998; Ng et al., submitted).

The fauna of Taiwan is reasonably well studied and many species of littoral sesarmid crabs are known from the coasts of Taiwan (Ng et al., 1996, 2001; Wang & Liu, 1998). Nevertheless, only recently the ecological work of the second author revealed a number of undescribed coastal crab species belonging to the Sesarmidae. One of them (to be described by Schubart & Ng, in preparation) is a rocky shore inhabitant and has large eggs, suggesting that larval development takes place in rock pools as previously described for *Armases miersii* (see Schuh et al., 1995; Cuesta et al., 1999). Two other new species were found in vegetated inland habitats in close vicinity of fresh water. Despite the inland habitat, both species have small eggs and return to the sea for larval release. The first species is a member of the genus *Geosesarma* according to its morphology and was described in Ng et al. (submitted). The second species occurs sympatrically, but can be distinguished by a morphology that differs considerably from all other known sesarmid genera and is therefore here described as a new genus and species.

## MATERIAL AND METHODS

Crabs belonging to the new species have been collected by the second author in southern and eastern Taiwan since 1999. A total of 614 crabs were collected throughout the last years for size comparisons and assessment of the reproductive status and other ecological factors. Most of the crabs were released after taking measurements. Others were preserved in ethanol and distributed among various museums. The holotype and a number of paratypes were deposited at the National Taiwan Museum (TMCD), Taipei, Taiwan. Other paratypes were donated to the Institute of Zoology, Academia Sinica (ASIZ), Nankang, Taipei, Taiwan; Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research, National University of Singapore; and the Senckenberg Museum (SMF), Frankfurt a. M., Germany. Measurements of the studied material represent the carapace width and length in millimetres. The abbreviations G1 and G2 are for the male first and second gonopods respectively.

Ovigerous crabs of the new species were collected from the Kangkou and Meilun river mouths as well as from Green Island (Luidau) between 1999 and 2000. First stage zoea larvae hatched in plastic containers with sea water and were preserved directly in 70% ethanol or fixed in 4% formalin for one day, previous to storage in ethanol. Larval appendages were dissected under a Wild MZ8 binocular microscope, and drawings were made using an Olympus BH-

2 microscope equipped with Nomarski interference contrast and an attached camera lucida. Semipermanent mounts were made of whole larvae and dissected appendages. Permanent mounts were made using polyvinyl lactophenol, and cover slips were sealed with nail varnish. All measurements were made by an ocular micrometer. Drawings and measurements were based on 10 larvae from each of 3 hatches originating from three different localities (Kangkou River mouth, Meilun River mouth, Green Island). The following measurements were made: rostro-dorsal length (rdl) was measured from the tip of the rostral spine to the tip of the dorsal spine; carapace length (cl) from the base of the rostrum to the posterior margin; carapace width (cw) as the greatest distance across the carapace. Descriptions and figures are arranged according to the standard proposed by Clark et al. (1998). The plumose natatory setae of the maxilliped exopods (Figs. 7C, D) and the terminal part of the furcal arms of the telson (Fig. 8C) are drawn truncated. Parental vouchers and samples of larvae have been deposited at the National Taiwan Museum, Taipei (TMCD 3278) and at the Institute of Zoology, Academia Sinica, Nankang, Taiwan (ASIZ 72745).

## TAXONOMY

### *Scandarma*, new genus

Type species. – *Scandarma lintou*, new species, by present designation.

**Diagnosis.** – Carapace squarish to gently sinuous, lateral carapace margin relatively narrow at exorbital teeth, continuously widening posterior to blunt anterolateral teeth. Palm of male chelae inflated, dorsal surface with longitudinal line of granules, no pectinated crests; dactylus dorsally with longitudinal row of horny tubercles and pollex with ventral row of spiny granules. G1 relatively short and stout; distal chitinous part short and spatulate; G2 short, with elongated distal segment.

**Etymology.** – The name is derived from the arbitrary combination of the Latin word “scandere” for climbing and the ending of the name “*Sesarma*”, alluding to the tree- and rock-climbing habit of the type species. The gender of the new genus is neuter.

**Remarks.** – *Scandarma*, new genus, shares the carapace and some chelipedal characters of *Pseudosesarma* Serène & Soh, 1970 and *Sesarmops* Serène & Soh, 1970, in its lateral carapace margin having one anterolateral tooth and a male chelar palm without pectinated crests. However, *Scandarma lintou* differs from all known species of *Pseudosesarma* and *Sesarmops* in the shape of the carapace and the tuberculation of the male chelae: the dorsal surface of the propodus carries one longitudinal line of granules, the dactylus one longitudinal row of horny tubercles and the pollex is characterized by a row of ventral spiny granules. Furthermore, all known species of *Pseudosesarma* and



*Sesarmops* have proportionately much broader and shorter ambulatory legs.

***Scandarma lintou*, new species**

(Figs. 1-8)

**Material examined.** – Holotype - male (17.55 by 16.9 mm) (TMCD 3276), Taiwan, Luidau (Green Island), coll. H.-C. Liu et al., 11 Sep.1999.

Paratypes – 1 male (13.8 by 13.6 mm), 2 females (16.2 by 15.7, 16.05 by 14.75 mm) (TMCD 3277), 1 male (19.20 by 18.7 mm), 1 female (18.55 by 16.7 mm) (SMF 28099), Taiwan, Pingtung County, Manchow, Kangkou River mouth, (21° 59' 26" N, 120° 50' 09" E), coll. H.-C. Liu, 2 Sep.1999; 2 males (14.8 by 14.3 mm, 13.4 by 12.7 mm), 6 females (17.2 by 15.8 mm, 17.1 by 16.1 mm, 16.8 by 15.5 mm, 16.6 by 15.4 mm, 15.5 by 14.3 mm, 13.9 by 13.0 mm) (TMCD 3278), same locality, coll. H.-C. Liu, 1 Sep.1999 (4 females parental vouchers); 1 male (16.8 by 16.5 mm) (ZRC 2000.1830), same locality, coll. C.D. Schubart & H.-C. Liu, 14 Sep.1999 (DNA voucher); 1 male (16.2 by 15.75 mm), 2 females (17.25 by 16.5, 18.4 by 17.9 mm) (ZRC 2001.0026), 1 juvenile male (8.2 by 8.15 mm) (ZRC 2001.0027), same locality, coll. P. K. L. Ng, 8 Nov.2000; 1 male (15.6 by 15.0 mm), 1 female (15.8 by 15.0 mm) (ASIZ 72746), 1 male (14.9 by 14.95 mm), 1 female (16.7 by 15.95 mm) (ZRC 2002.0164), same locality, coll. H.-C. Liu, 20 Jun.2001; 3 males (14.05 by 13.80, 13.3 by 12.6, 12.40 by 12.05 mm), 1 female (11.35 by 10.8 mm) (ASIZ 72744), Taiwan, Hualien County, Hualien, Meilun R. mouth, (23° 58' 54" N, 121° 36' 37" E), coll. H.-C. Liu, 17 Jun.2000; 1 ovigerous female (12.7 by 11.85 mm) (ASIZ 72745), same locality, coll. H.-C. Liu, 21 Sep.2000 (parental voucher); 1 male (13.8 by 13.55 mm), 1 female (18.1 by 17.25 mm) (ZRC 2002.0165), 1 male (18.3 by 18.1 mm) (ZRC 2002.0169), 1 male (19.25 by 18.85 mm) (ZRC 2002.0168), same locality, coll. H.-C. Liu, 17 Jun.2001; 1 male (19.3 by 18.5 mm); 1 female (14.5 by 13.5 mm) (TMCD 3288), same locality, coll. H.-C. Liu, 27 Oct.2001.

Others – 1 female (13.9 by 13.2 mm) (TMCD 3279), Taiwan, Pingtung County, Manchow, Kangkou R. mouth, (21° 59' 26" N, 120° 50' 09" E), coll. H.-C. Liu, 1 Dec.1999; 1 ovigerous female (18.5 by 16.2 mm), same locality, coll. H.-C. Liu, 5 Oct.1999; 1 male (14.7 by 14.2 mm); 4 ovigerous females (18.4 by 17.2 mm, 17.8 by 16.4 mm, 15.0 by 13.8 mm, 14.3 by 13.8 mm), 2 females (18.5 by 17.6 mm, 7.9 by 7.1 mm) (TMCD 3280), same locality, coll. H.-C. Liu, 5 Oct.1999; 1 male (14.6 by 14.1 mm); 2 females (19.1 by 17.7 mm, 18.0 by 17.0 mm) (TMCD 3281), same locality, coll. H.-C. Liu, 11 Dec.1999; 2 females (18.9 by 18.0 mm, 14.4 by 13.8 mm) (ASIZ 72747), Taiwan, Pingtung County, Manchow, Kangkou R., 1 km from mouth, (21° 59' 24" N, 120° 49' 29" E), coll. H.-C. Liu, 20 Jun.2001; 1 female (13.2 by 11.1 mm) (TMCD 3282) Taiwan, Pingtung County, Hengchun, Hsiangchiaowan, (21° 55' 32" N, 120° 49' 33" E), coll. H.-C. Liu, 5 Oct.1999; 2 males (13.9 by 13.5 mm, 9.6 by 8.9 mm), 4 females (13.2 by 12.2 mm, 12.6 by 11.7 mm, 12.5 by 11.5 mm, 10.0 by 9.4 mm) (TMCD 3283) Taiwan, Pingtung County, Checheng, Paoli R. mouth, coll. H.-C. Liu, 7 Oct.1999; 10 males (18.7 by 18.1 mm, 13.5 by 13.1 mm, 13.4 by 12.8 mm, 12.0 by 11.4 mm, 10.2 by 9.9 mm, 9.4 by 9.1 mm, 9.1 by 8.7 mm, 9.1 by 8.4 mm, 8.1 by 7.6 mm, 6.6 by 6.1 mm); 6 females (14.1 by 13.3 mm, 10.0 by 9.1 mm, 9.4 by 8.9 mm, 9.1 by 8.5 mm, 8.7 by 8.1 mm, 6.4 by 6.2 mm), (TMCD 3284) Taiwan, Hualien County, Hualien, Meilun R. mouth, (23° 58' 54" N, 121° 36' 37" E), coll. H.-C. Liu, 17 Jun.2000; 1 male (19.0 by 17.9 mm); 2 ovigerous females (15.5 by 14.6 mm, 15.0 by 14.6 mm), 2 females (20.5 by 18.7 mm, 10.7 by 10.0 mm) (ASIZ 72748), same locality, coll. H.-C. Liu, 5 Aug.2000; 2 ovigerous females

(13.7 by 11.0 mm, 14.5 by 13.3 mm) (TMCD 3285), same locality, coll. H.-C. Liu, 15 Nov.2000 (parental vouchers); 2 ovigerous females (14.7 by 13.4 mm, 13.3 by 12.6 mm) (TMCD 3286), same locality, coll. H.-C. Liu, 21 Sep.2000 (parental vouchers); 1 ovigerous female (13.2 by 12.2 mm) (TMCD 3287), same locality, coll. H.-C. Liu, 17 Aug.2000; 1 male (8.9 by 8.5 mm); 1 female (12.8 by 12.0 mm) (TMCD 3289), same locality, coll. H.-C. Liu, 18 May.2000.

**Diagnosis.** – Carapace squarish to gently sinuous, lateral carapace margin relatively narrow at exorbital teeth, continuously widening posterior to blunt anterolateral teeth, broadest at ventral extension. Dorsal surface of male chelar palm with one longitudinal line of granules, outer surface angular with tubercular protuberance at outermost point and conspicuously flattened fingers; dactylus dorsally with longitudinal row of horny tubercles, pollex ventrally with row of spines. Legs long and slender. G1 relatively short and stout; distal chitinous part short and spoon-shaped; G2 short, with thin and long distal segment.

**Description of male holotype.** – Carapace squarish to gently sinuous, slightly broader (17.55 mm) than long (16.9 mm), and flattened (9.05 mm height); dorsal surface smooth and glabrous; regions distinct, separated by prominent grooves; branchial regions with faint indication of oblique striae (Figs. 1A, B). Frontal margin strongly deflexed, two inner frontal lobes broad and distinct, outer lobes less than half as broad as inner lobes; deep fissure between inner lobes extending posteriorly to mesogastric region, flanked by swollen postfrontal regions (Fig. 1B). Front relatively narrow (7.7 mm), clearly less than half (0.44) of maximum carapace width, concave, ventral border strongly deflexed and bent outwards (Fig. 1C). Posterior border of orbits slightly directed postero-laterally; external orbital tooth low, directed anteriorly, outer margin of tooth curved, posteriorly bending into shallow but prominent notch; anterolateral tooth elevated and blunt, second anterolateral tooth only indicated as slight elevation; carapace margins posterior to second carapace teeth continuously widening (Fig. 1B); lateral border of carapace broadest at most ventral extension, where it touches base of walking legs between pereopods 3 and 4.

Eyes pigmented, cornea wider than eyestalk; suborbital ridge prominent and setose with tufts of long setae at medial end; epistome flat and granulate, upper row of setae delimiting Verwey's groove absent (Fig. 1C). Pterygostomial and epibranchial regions granulate and covered by dense mat of long and geniculate setae, dorsally separated from lateral carapace border by row of long setae grouped into three short anterior rows and one long posterior one. Third maxillipeds with median gape, uncovering mandibles; ischium with shallow median sulcus; meri of third maxilliped longitudinally ovate, touching each other distally; inner margin straight with thickened ledge (Fig. 1C); exopod completely covered, slender, with short and thin flagellum that does not extend across width of merus.

Male chelipeds subequal, left chela slightly smaller, probably regenerated; outer surface (mostly carpus and palm) with numerous rounded granules. Ventral margins of merus

serrated, dorsal margin convex with distal indentation, no subdistal spines; inner face oval with one longitudinal row of long setae ventrally, scattered setae dorsally. Carpus roughly quadrangular and short, outer surface coarsely granulate, but without distinct teeth or spines. Propodus with ventral border slightly convex; palm inflated and coarsely granulate at inner and outer base; outer surface angular with tubercular protuberance at outermost point (here defined as apex) (Figs. 2A-C); granules ventral of apex small and inconspicuous, granules dorsal of apex coarse and round; outer surface distal from apex smooth and gradually flattening towards fingers; inner surface of palm swollen and granulate, with indication of a vertical row of tubercles;

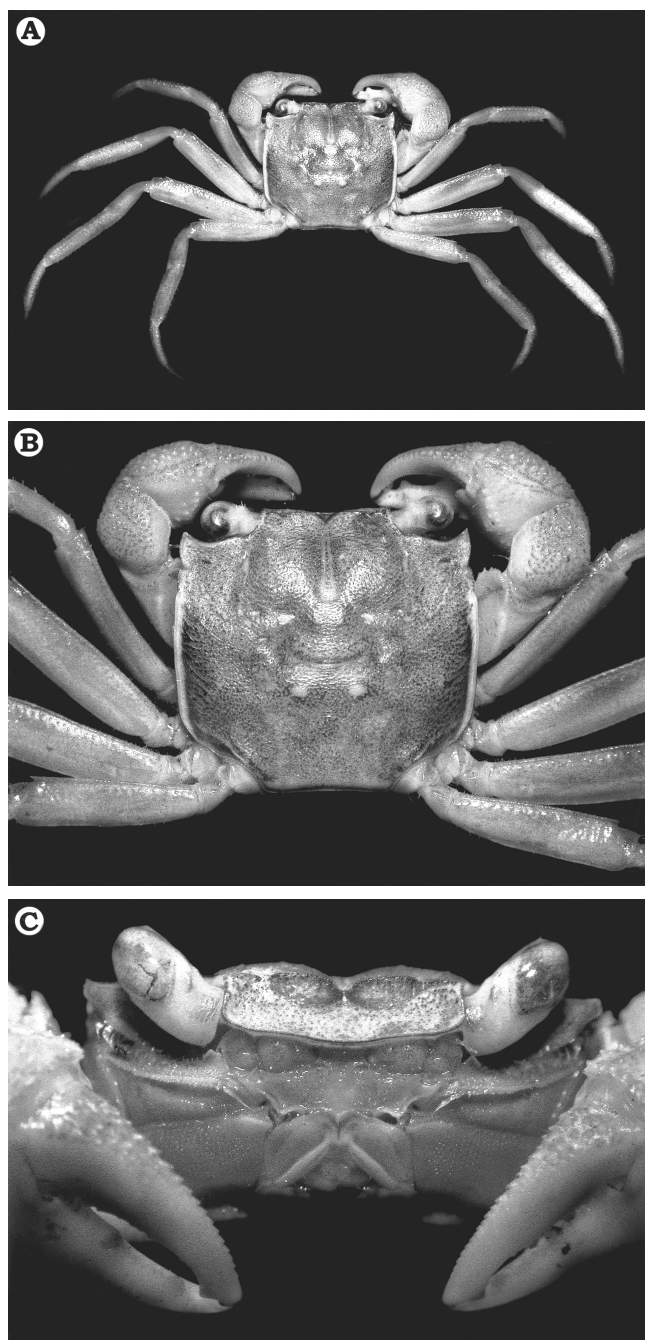


Fig. 1. *Scandarma lintou*, new species. Holotype male (17.55 by 16.9 mm) (TMCD 3276), Taiwan. A, overall view; B, dorsal carapace; C, frontal view.

dorsal surface of palm with one longitudinal line of granules anterior to upper crest of tubercles (Figs. 2A, B); distal part of upper tubercular crest elevated and pointing towards dactylus. Fingers approximately as long as palm, concavely bent towards outside, forming medial gape when closed; cutting edges armed with smaller denticles at base, with one strong subdistal tooth on pollex and one less strong distal tooth on dactylus, tips of fingers sharp and denticulate; outer surface of fingers smooth and conspicuously flattened (Figs. 2C, 3A, B); dactylus dorsally with few short proximal spiny granules and a longitudinal row of 12-13 round horny tubercles, pointing distally and extending almost to distal tip (Figs. 1C, 2A-C); pollex ventrally lined with approximately 12 sharp granules (spines) pointing distally (Figs. 3A, B), probably used for stridulation.

Pereiopods 2-5 (ambulatory legs) long and slender, pereiopods 4 longest (Fig. 1A); tufts of dense and fine setae between bases of pereiopods 2 and 3 and pereiopods 3 and 4. Meri of all walking legs slender, dorsal margin of merus almost smooth, with low and spiniform subdistal tooth; merus and carpus glabrous; outer surface of carpus with two longitudinal ridges. Propodi of pereiopods 3 and 4 clearly more than three times as long as broad; dorsal and ventral margins of propodus and dactylus with numerous short and stiff setae or spines, not obscuring margins, strongest spines ventrally at distal end of propodus. Dactyls long and curved with short and thin spiny tips.

Thoracic sternites mostly glabrous and smooth; sternite 3 anteriorly pointed and posteriorly lined by fine setae, abdominal cavity reaches beyond midpoint of sternite 4. Abdomen roughly triangular; telson slightly longer than broad and about the length of segment 6, tip rounded (Fig. 3C). Segment 6 with lateral margins convex, much broader than long; lateral margins of segment 5 straight, that of segment 4 gently concave, and that of segment 3 markedly convex. Segments 1 and 2 narrow and evenly broad. G1 relatively short (5.8 mm) and stout; distal part gently turning outwards; distal chitinous part short and spoon-shaped (Fig. 4), lined by long setae. G2 short, with thin and long distal segment reaching up to half length of G1.

**Paratypes.** – In most specimens the chelae are homochelous, the paratype male SMF 28099 has a larger right chela with two strong subdistal teeth on the cutting edge of pollex. In smaller specimens, the fingers appear proportionally short and do not gape. The chelae of females are much weaker, with no gape and proportionately more slender and pointed. Female gonopores are elevated, arched, and pointing anteriorly. Otherwise, the female specimens agree with the male in all non-sexual characters.

**Colour in life.** – The carapace colour of *S. lintou* is mostly yellowish brown and darkly mottled; four small light spots are grouped symmetrically around the mesogastric region; branchial regions sometimes dark; the lateral carapace border is lined by a bright yellow line posterior to (sometimes imaginary) position of second anterolateral teeth. The bases of the chelae are dorsally light brown, turning into orange towards ventral. The fingers are white (Fig. 5).

**Size.** – The maximum carapace width (cw) of *Scandarma lintou* is 22.1 mm in males (n=264) and 21.8 mm in females (n=350). The smallest ovigerous female obtained measured 11.4 mm cw (n=135), but, according to abdomen morphology, the smallest size of mature female was 10.3 mm cw. Males have relatively larger chelae than females.

**Etymology.** – The name “lintou” corresponds to the Chinese name for the screw pine *Pandanus odoratissimus*. In southwestern Taiwan and Green Island this plant constitutes the favourite habitat of this crab. The name is used as a noun in apposition.

**Ecology.** – *Scandarma lintou* is a semi-terrestrial (adults

terrestrial) crab, usually found less than 300 m away from the sea. Along the Kangkou River, the crabs were encountered in a distance of one kilometre from the sea. In southern Taiwan and Green Island, the presence of this species is always associated with three environmental factors: 1) the close proximity of a stream or freshwater pools, 2) protection from strong winds, and 3) the presence of the screw pine or pandang *Pandanus odoratissimus* (Pandanales: Pandanaceae). At these localities, *Scandarma lintou* was found hiding in the leaf axils of *P. odoratissimus* at daytime, while active on the leaf surfaces of the same plant or other nearby plants at night. In eastern Taiwan, however, where

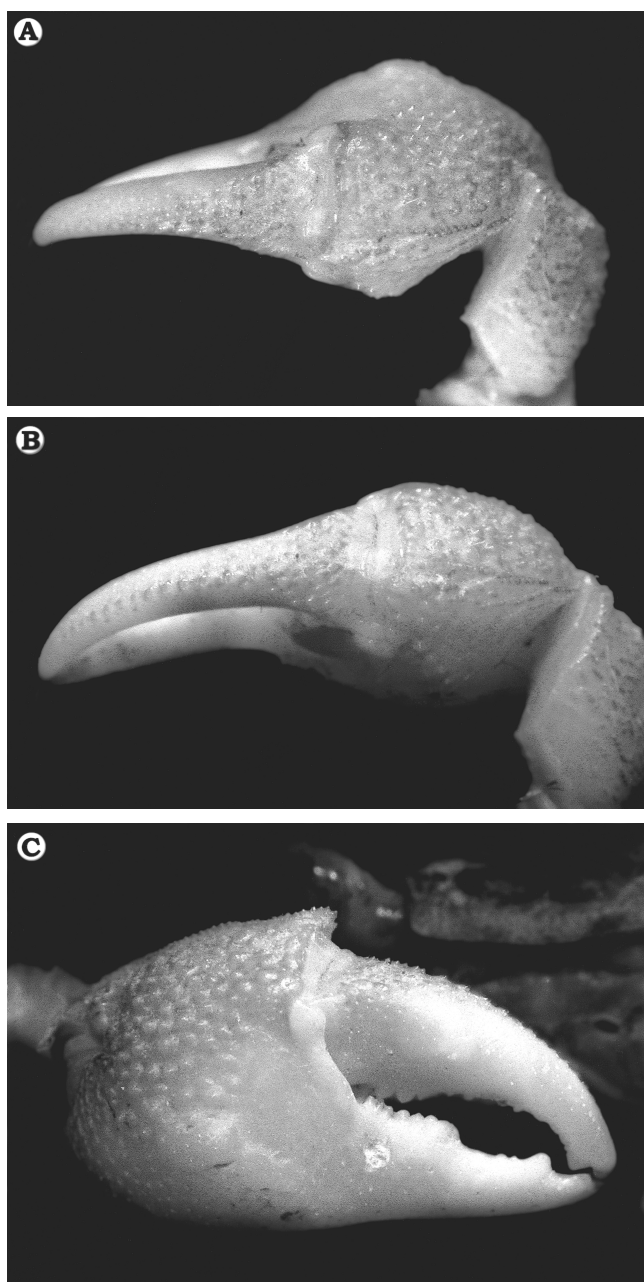


Fig. 2. *Scandarma lintou*, new species. Holotype male (17.55 by 16.9 mm) (TMCD 3276), Taiwan. Right chela; A, outer dorsal view with flattened fingers; B, inner dorsal view with curved fingers; C, dorso-frontal view with dactylar tubercles.

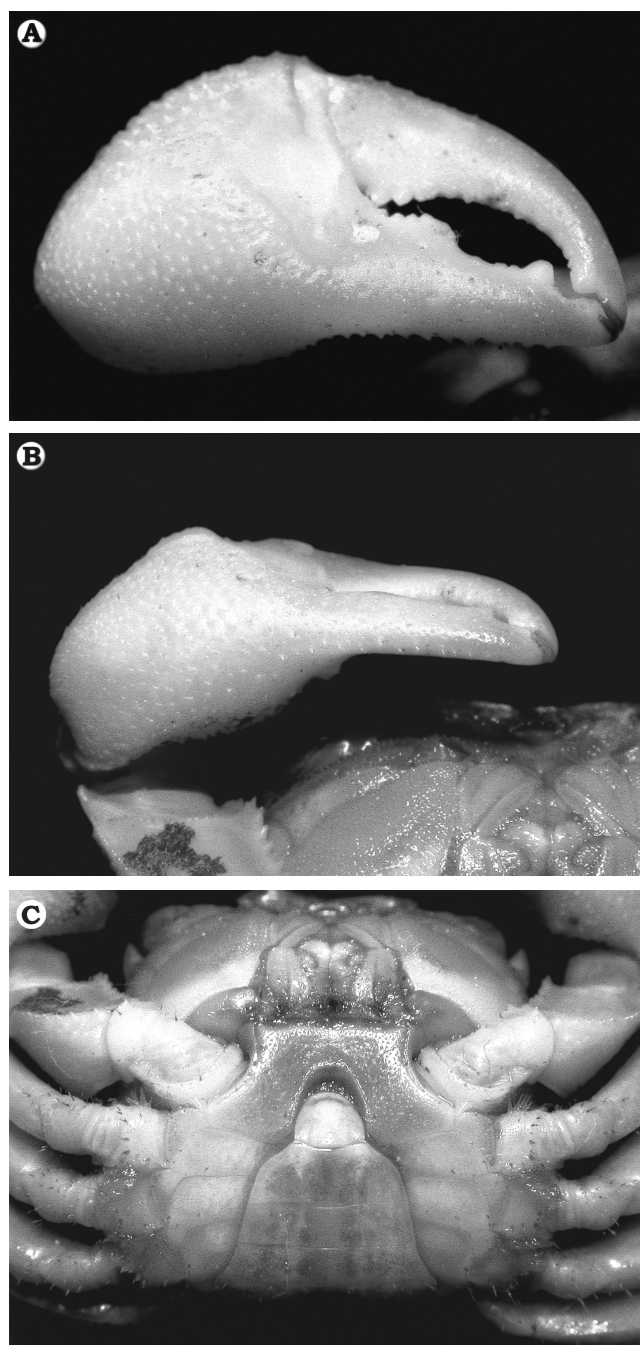


Fig. 3. *Scandarma lintou*, new species. Holotype male (17.55 by 16.9 mm) (TMCD 3276), Taiwan. A, right chela, ventro-frontal view with pollex granules; B, right chela, ventral view; C, sternum and pleon.



*P. odoratissimus* is not present, *Scandarma lintou* finds refuge under man-made concrete blocks on the forest floor or in crevices of vertical concrete walls. Also in this case, the habitat is close to fresh water and protected from strong winds.

*Scandarma lintou* is a nocturnal and mostly arboreal animal. At night, it can be found climbing on leaf surfaces, twigs, trunks, vines, grasses and sometimes also on the ground. It moves up trees as high as five metres. When climbing on trees, the crabs are constantly picking small food items from the surface of the plants with both of their chelae. Food items that were observed to be ingested included flowers, fruits, bark and some small invertebrates living on trees. Water availability seems to be the more important factor limiting the activity as compared to temperature: the crabs increased activity when rainfall dampened their habitat.

*Scandarma lintou* has a seasonal breeding, taking place from June to January. Ovigerous crabs have small eggs which hatch out into pelagic, free-swimming larvae. As the hatching approaches, ovigerous females migrate to the estuaries and release larvae into brackish water. The timing of larval release does not seem to follow lunar or semilunar periodicity. Releasing behavior could be observed throughout the month during the breeding season. The timing of larval release also does not correlate with tidal peaks. Female *Scandarma lintou* most abundantly released larvae in the evening hours (between 1900 and 2000 hours). It was noticed that both sexes lose their appendages by autotomy easily during handling.

**Description of zoea I.**

Dimensions: rdl:  $0.78 \pm 0.03$  mm; cl:  $0.44 \pm 0.02$  mm; cw:  $0.36 \pm 0.02$  mm.

Carapace (Fig. 6A). Globose, smooth and without tubercles. Dorsal spine present, short and curved. Rostral spine present, straight and equal in length to dorsal spine. Lateral spines absent. A pair of setae on posterodorsal and anterodorsal regions. Posterior and ventral margin without setae. Eyes sessile.

Antennule (Fig. 6B). Uniramous; endopod absent. Exopod unsegmented with 4 terminal aesthetascs (3 long, 1 shorter and thin) and 1 terminal seta.

Antenna (Fig. 6C). Well developed protopod almost reaching the tip of the rostral spine and bearing two unequal rows of well-developed spines. Endopod absent; exopod elongated, more than 2/3 of the protopod length, with 2 terminal setae (1 long reaching to the tip of protopod, 1 shorter) and 5 small terminal spines.

Mandible. Endopod palp absent.

Maxillule (Fig. 7A). Coxal endite with 6 plumose setae. Basal endite with 5 setae (2 cuspidate and 3 plumodenticulate). Endopod 2-segmented with 1 seta on the proximal segment and 1 subterminal and 4 terminal plumodenticulate setae on the distal segment. Exopod seta absent; epipod seta absent.

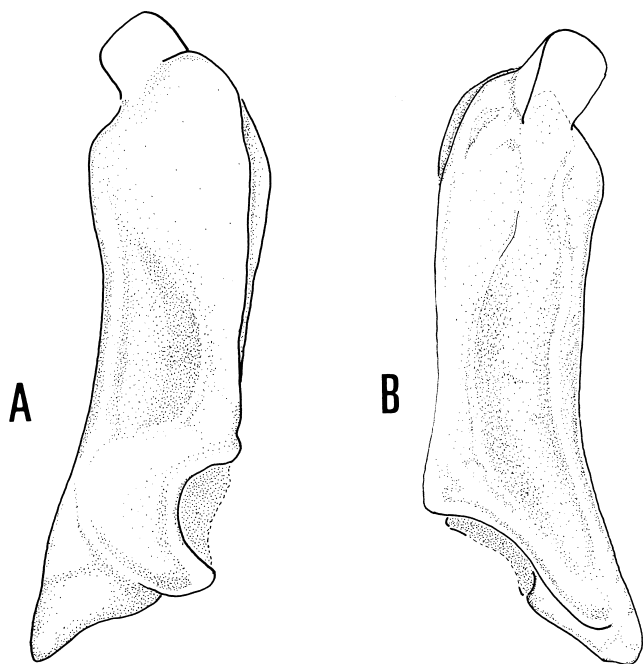


Fig. 4. *Scandarma lintou*, new species. Holotype male (17.55 by 16.9 mm) (TMCD 3276), Taiwan. Male right gonopod (setae removed), A, ventral view, B, dorsal view.



Fig. 5. *Scandarma lintou*, new species. Life colours.

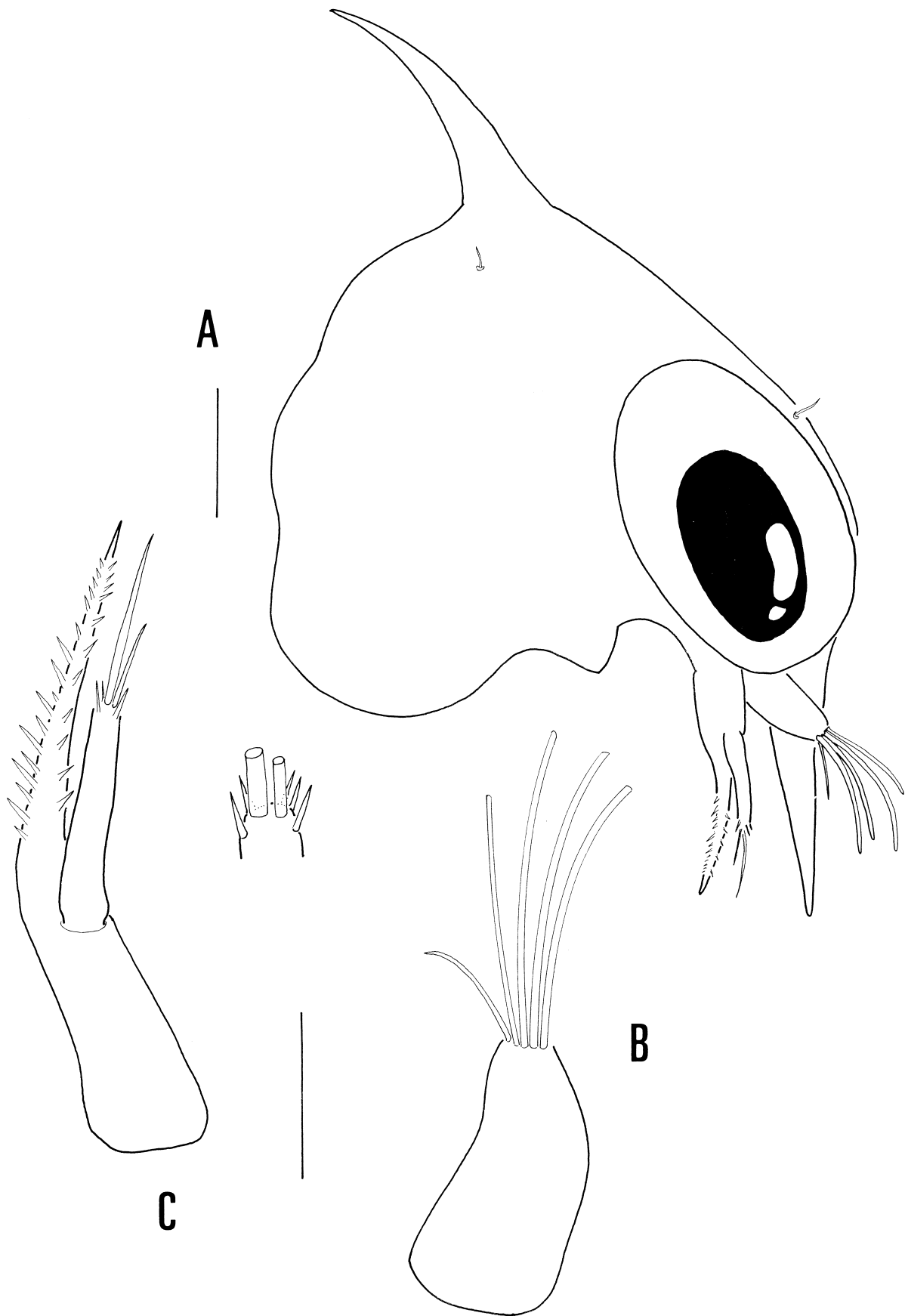


Fig. 6. *Scandarma lintou*, new species. Zoea 1, Taiwan. A, carapace, lateral view; B, antennule; C, antenna, including detail of terminal end of exopod. Scale bars: A, 0.1 mm, B,C, 0.05 mm.

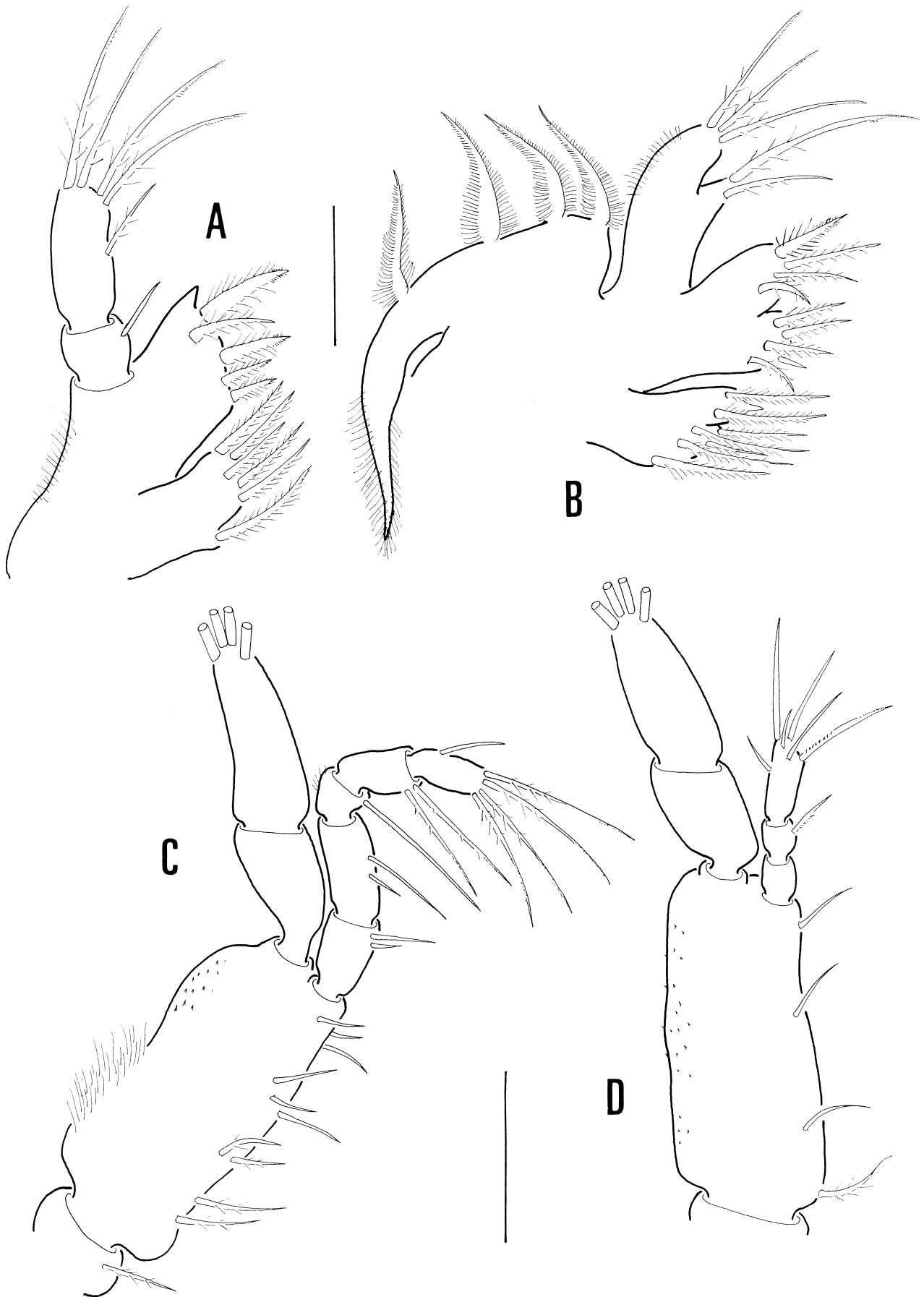


Fig. 7. *Scandarma lintou*, new species. Zoea 1, Taiwan. A, maxillule; B, maxilla; C, first maxilliped; D, second maxilliped. Scale bars: A, B, 0.05 mm; C, D, 0.1 mm.

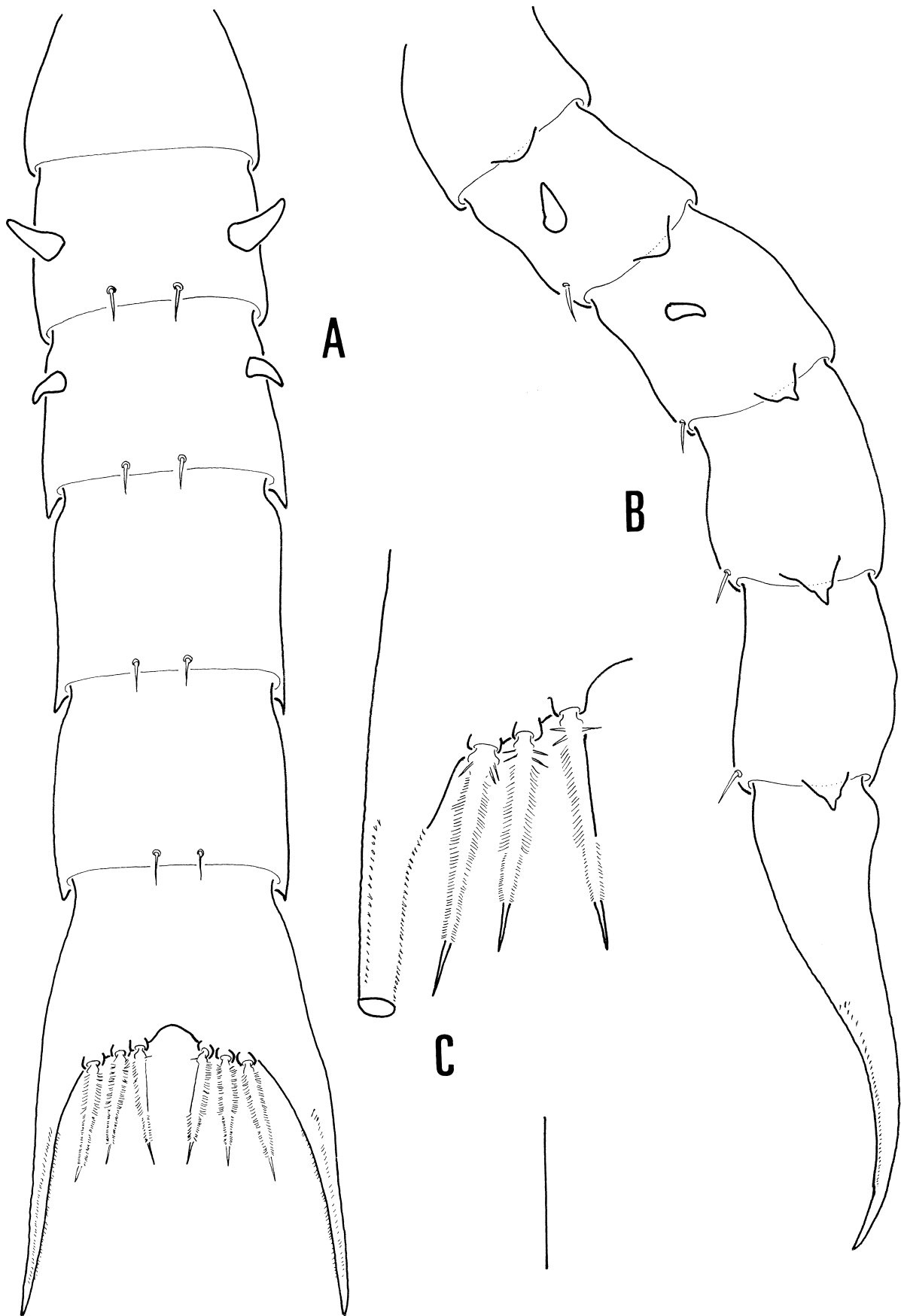


Fig. 8. *Scandarma lintou*, new species. Zoea 1, Taiwan. A, abdomen, dorsal view; B, abdomen, lateral view; C, telson detail. Scale bars: A, B, 0.1 mm; C, 0.05 mm.

Maxilla (Fig. 7B). Coxal endite bilobed with 5+2 (plus a marginal spine) plumodenticulate setae. Basial endite bilobed with 5+4 plumodenticulate setae. Endopod unsegmented, bilobed with 2+3 long plumodenticulate setae on the inner and outer lobe respectively. Scaphognathite with 4 plumose marginal setae and a long setose posterior process.

First Maxilliped (Fig. 7C). Coxa with 1 seta. Basis with 10 medial setae arranged 2,2,3,3, and a mat of long dorsobasal microtrichiae. Endopod 5-segmented with 2,2,1,2,5 (1 subterminal + 4 terminal) setae. Exopod 2-segmented, distal segment with 4 long terminal plumose natatory setae.

Second Maxilliped (Fig. 7D). Coxa without setae. Basis with 4 medial setae arranged 1,1,1,1. Endopod 3-segmented with 0,1,6 (3 subterminal + 3 terminal) setae. Exopod 2-segmented, distal segment with 4 long terminal plumose natatory setae.

Third Maxilliped. Absent.

Pereiopods. Absent.

Abdomen (Figs. 8A, B). Five abdominal somites. Somites 2 and 3 with pair of dorsolateral processes. Somites 3-5 with small posterolateral processes of subtriangular shape. Somites 2-5 with a pair of posterodorsal setae. Pleopods absent.

Telson (Fig. 8C). Telson bifurcated with 3 pairs of serrulate setae on posterior margin; mid-internal side of inner pair without spines. Dorsal part of each furcal branch with two rows of spines.

**Remarks.** - *Scandarma lintou* has been previously mentioned as undescribed crab with two colour photographs in the Taiwanese natural history crab book "The information of crabs' watching in Taiwan" (Lee, 2001: 135). During the publication process of the present study, an undescribed crab species, which is strikingly similar in its morphology as well as habitat preferences to *S. lintou* was discovered in Sarawak by Peter K. L. Ng (pers. comm., 2002). This crab species probably will have to be considered congeneric with *S. lintou*.

The larvae of *Scandarma lintou* did not differ among the three Taiwanese localities from which they had been obtained. The larval morphology presents the typical combination of features that characterize all sesarmid larvae. However, two remarkable characters allow to distinguish this genus and species from other related ones. The antenna presents a well developed exopod, with a length of more than 2/3 of the protopod and a long terminal seta reaching to the tip of the protopod. Among all known sesarmid zoea, only the first zoeal stage of *Selatium brockii* presents a somewhat similar antenna (see Vijayakumar & Kannupandi, 1987). Also the presence of a mat of long microtrichiae on the dorsobasal part of the basis of the first maxilliped had not been noticed previously in any other

sesarmid larvae. The larval characters clearly show that this species belongs to Sesarmidae, but confirm that it cannot be placed in any of the presently recognized sesarmid genera.

In 2002, the second author returned to the locality in southern Taiwan, where *Scandarma lintou* was initially discovered and originally abundant: the Kangkou River mouth in Pingtung County. He found that most of the vegetation had been cut down including the *Pandanus* screw pines. Together with the vegetation, most of the tree-climbing crab fauna had disappeared. Considering that *Scandarma lintou* has so far only been found near freshwater in the vicinity of the coast and that the screw pines are the most preferred shelter and feeding ground of this species, this loss of estuarine vegetation constitutes a severe threat for this crab species, which is apparently restricted to the island of Taiwan. The authors therefore recommend that the vegetation around estuaries along the southern and eastern coast of Taiwan must be protected to ensure the survival of this newly discovered and beautiful Taiwanese species.

The present description of the genus *Scandarma* is one more component to the revision of the systematics of several sesarmid genera currently carried out by P. K. L. Ng and the first author of the present study. According to Serène & Soh's (1970) classification, *Scandarma lintou* would be closest to *Pseudosesarma* or *Sesarmops*. However, the here described species, and possibly a new one from Sarawak (P. K. L. Ng, pers. comm., 2002), can be distinguished by several key characters (see genus diagnosis). Furthermore, morphological and molecular work on several sesarmid genera, has shown that *Pseudosesarma* as well as *Sesarmops* are polyphyletic and need to be re-defined (some of its members are closely related to *Chiromantes* sensu lato). A major reclassification of sesarmid species will be necessary to account for these recent findings. The DNA-sequence of the mitochondrial 16S rRNA gene of *Scandarma lintou* (unpublished) as well as its adult and larval morphology (see above), do not allow to place this species close to any currently recognized species of *Pseudosesarma* or *Sesarmops*. Consequently, and for the purpose of taxonomic clarity, a monotypic genus *Scandarma* is herewith created in the hope that its affinities to other sesarmid genera will be further clarified in the future.

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