

- Fig. 12. *Valkeria uva*, Linn. $\times 85$. Portion from near the growing end, showing a pair of zoecia and immediately below a pair of processes which may form radicles or grow into fresh branching stems, or even sometimes into fresh zoecia. The attachments of muscles, in the stem, below the septum are also shown. From Poole.
13. *Valkeria uva*, Linn. $\times 85$. Stem seen from the sides, showing the zoöcial and stem rosette plate, and the muscles below the septum.
14. *Crisia cylindrica*, Busk. $\times 12$. From Gimsah Bay.
15. Do. do. $\times 50$. From Gimsah Bay.
16. *Filisparsa tubulosa*, Busk. $\times 25$. Showing the ovicell in course of formation. The finely perforated wall is commencing to grow from the frontal wall and from the wall of each zoöcium. From Ras el Millan.
17. Do. do. $\times 7$.

REPORTS on the MARINE BIOLOGY of the SUDANESE RED SEA.—XVI. PYCNOGONIDA from the RED SEA and INDIAN OCEAN, collected by Mr. CYRIL CROSSLAND. By GEORGE H. CARPENTER, B.Sc. Lond., M.R.I.A., Professor of Zoology in the Royal College of Science, Dublin. (Communicated by Prof. W. A. HERDMAN, F.R.S., F.L.S.)

(PLATES 26 & 27.)

[Read 16th December, 1909.]

THROUGH the courtesy of Prof. Herdman of Liverpool and Dr. W. T. Calman of the British Museum, I have been entrusted with a few examples of "sea-spiders" collected on the east coast of Africa by Mr. Cyril Crossland. They prove to belong to undescribed species of the widespread genera *Nymphon* and *Pallenopsis*.

The localities from which these specimens were obtained lie to the north and east of the district surveyed by Prof. Stanley Gardiner, whose collection of Pycnogonida I have recently (1907) described. The present short contribution may be regarded as supplementing, to some extent, the account of Prof. Gardiner's collection, and I use here the same terminology as in that paper (*l. c.* pp. 95-6).

Family *Nymphonidæ*.

NYPHON, *Fabr.*

NYPHON MACULATUM, sp. nov. (Plate 26. figs. 1-9.)

Male, length 6 mm. (including proboscis).

Head half the total length of the body, neck slender and elongate. Pro-

boscis short and stout. Leg-bearing segments slender, with processes well separated. Abdomen very short (fig. 1). Eye-eminence prominent with somewhat blunt apex, eyes large (fig. 2). Chelifori small, but with "hand" and "finger" relatively elongate, strongly curved, and armed with prominent teeth (fig. 3). Palp with 2nd segment longest, 3rd and 4th subequal, 5th about a half shorter than either of latter (fig. 4). Oviger with elongate 5th segment; denticulate spines on terminal segments comparatively simple, usually with four serrations on each side (figs. 5, 6). Legs, like body, smooth, almost devoid of spines; 2nd coxal segment four times as long as the first; thigh rather shorter than 1st tibial segment, which is about equal in length to the 2nd tibial segment (fig. 1); propodus two and a half times as long as tarsus, bearing a rather broad claw and slender elongate auxiliary claws; a few feeble spines and bristles beneath the propodus (fig. 8). The colour of the animal is yellow with scattered black spots (fig. 1).

Habitat. Port Sudan Harbour, Red Sea; on a buoy among crowded *Margaritifera vulgaris*, June 1906. Three males, one with eggs. (Type in Zoological Museum, Liverpool.)

The very elongate neck and body together with the short abdomen, excessively long 2nd coxal segment, and well-developed auxiliary claws serve to distinguish this species from other members of the great genus *Nymphon*. Examination of the nervous system shows that the two hinder ganglia are both situated in the third leg-bearing segment (fig. 9). The male with eggs attached to the oviger (fig. 1) has the fourth and fifth segments of that limb longer than in the other specimens (from one of which fig. 5 was drawn). Perhaps the latter are not quite adult. The egg-mass is elongate. A few of the eggs are hatched, the larva (fig. 7) being of the typical pycnogonid type with three pairs of appendages. The cheliforus has its cement-gland opening at the tip of a long sickle-shaped process. The succeeding limbs have no fringe of swimming-hairs; the terminal segment in each bears a prominent claw-like process.

The denticulate spines on the terminal segment of the oviger show an interesting transition from a very simple condition to a typical nymphonid denticulate spine, in which, however, there are only four sinuate prominences on each side besides the usual basal tooth.

Family Pallénidæ.

PALLENOPSIS, *Wilson*.

PALLENOPSIS *CROSSLANDI*, sp. nov. (Plate 27. figs. 10–20.)

Female, length 8 mm. (including proboscis and abdomen).

Body broad, ovate, with lateral processes of segments close together; terga of 3rd and 4th leg-bearing segments fused. Head half the length of body

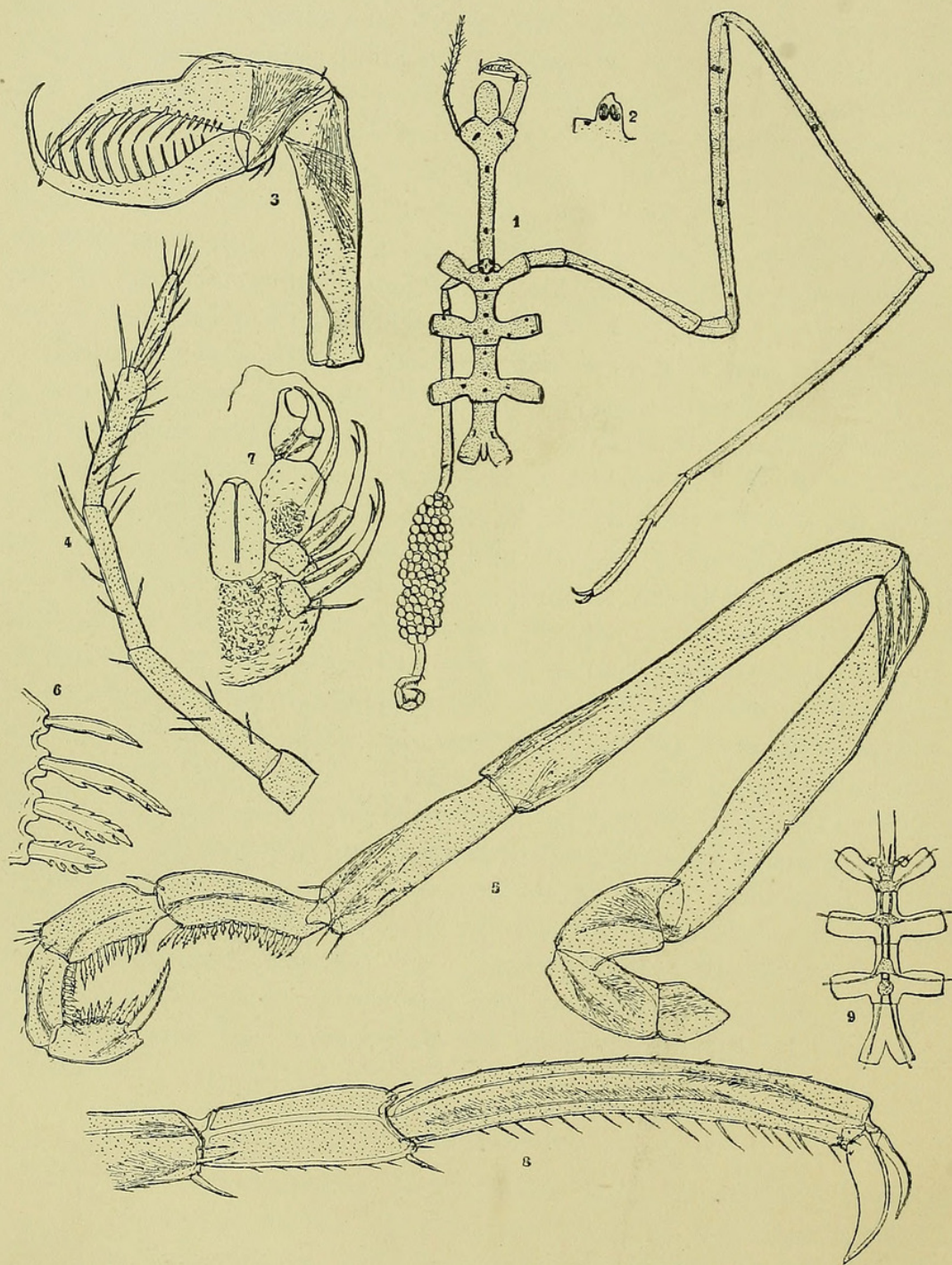
(without proboscis and abdomen) (figs. 10, 11). Proboscis elongate, swollen in middle. Abdomen elongate, spinose, nearly half as long as rest of body. Eye-eminence very prominent with blunt apex; eyes small, hinder at higher level than forward pair (fig. 10). Chelifori with elongate slender scape showing a trace of jointing only (figs. 10, 11, 14); "hand" stout, beset with spines, "fingers" stout and strong with marked shearing edges (fig. 13). Palp vestigial, as usual in the genus (figs. 14, 15). Oviger eight-segmented (fig. 16). Legs with 2nd coxal segment three times as long as first (fig. 10); thigh with a few long denticulate spines and a blunt apical process (fig. 10); 1st tibial segment as long as thigh, beset with numerous denticulate spines, most of which are set on finger-like processes (figs. 10, 18); 2nd tibial segment one-fifth longer than first, with numerous slender spines and bristles; propodus with six strong basal spines, and very large accessory claws which almost equal the principal claw in length (fig. 20).

Habitat. Wasin Channel, coast of British East Africa, 10 fathoms, 1902. A single female. (Type in University Museum, Cambridge.)

This curious and beautiful pycnogon is perhaps the most interesting species of that remarkable genus *Pallenopsis* yet discovered. The broad form of the body and the partial fusion of the segments would lead to the inclusion of the species in the subgenus *Rigona*, recently proposed by Loman (1908, pp. 67-8) for some Malayan and Australian members of *Pallenopsis*. In those species, however, it is stated that the scape of the cheliforus is altogether unsegmented, while in *P. Crosslandi* there is a distinct trace of jointing. The oviger is apparently eight-segmented, owing to the fusion of the seventh and eighth and the ninth and tenth segments (fig. 16), a condition noticeable in other female *Pallenopsis*. In the legs the curious finger-like processes on the first tibial segment are especially noteworthy (fig. 18). These, and indeed the legs generally, are beset with the prominent openings of numerous cuticular glands, provided at the edge of the orifice with small sharp spines (fig. 19). The elongate spines on the thigh and the first tibial segment are highly denticulate (figs. 10, 18). Another noteworthy feature is the great length of the accessory claws (fig. 20), nearly equalling the principal claw. The variation of this character in the genus *Pallenopsis* is remarkable and instructive.

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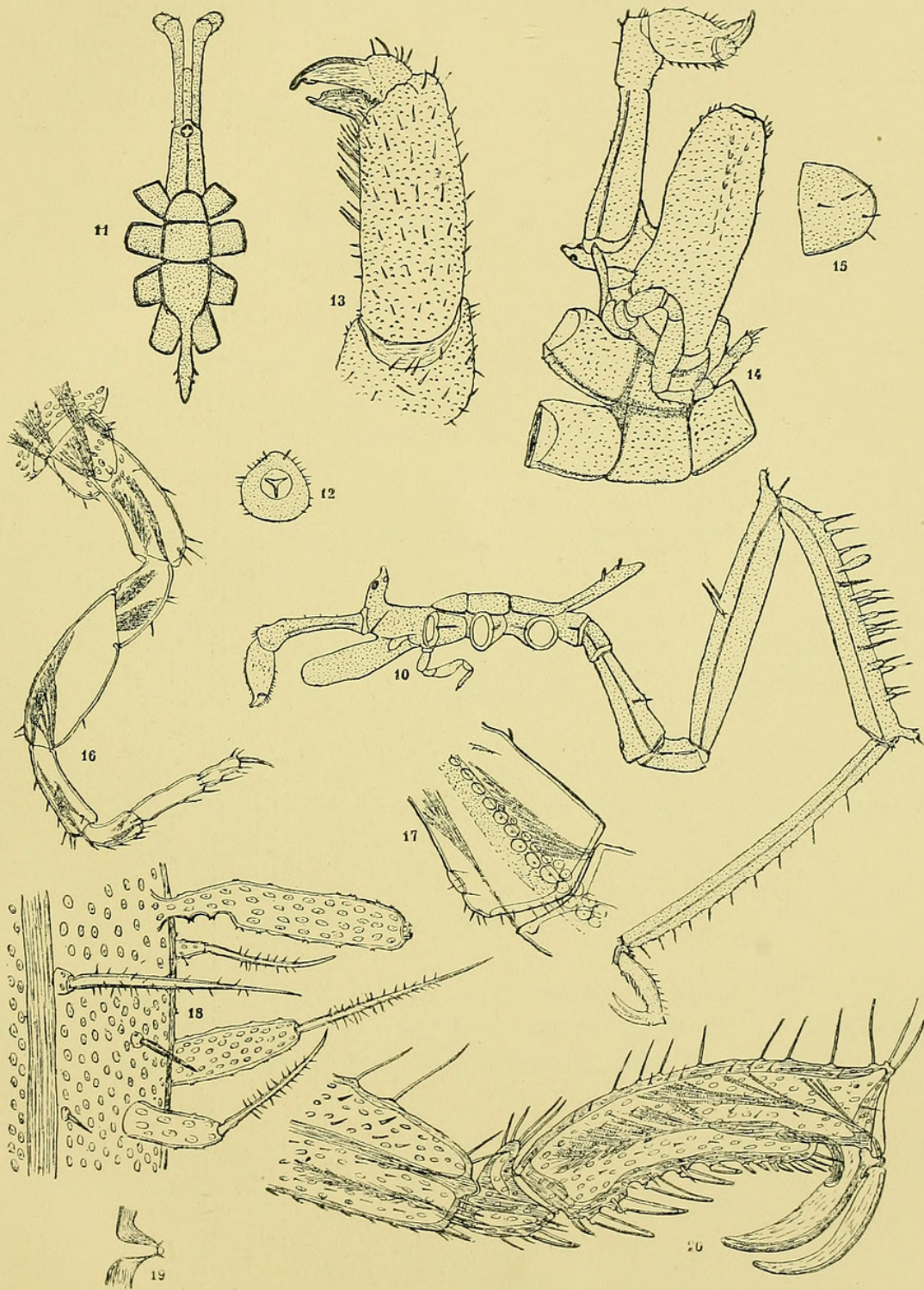
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G. H. C. del.

Grout, sc.

PYCNOGONIDA FROM THE RED SEA.



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EXPLANATION OF THE PLATES.

PLATE 26.

- Fig. 1. *Nymphon maculatum*. Male, dorsal view, showing right cheliforus, left palp and oviger, and right 1st leg. $\times 8$.
 2. " " Eye-eminence, side view. $\times 13$.
 3. " " Cheliforus. $\times 40$.
 4. " " Palp. $\times 40$.
 5. " " Oviger. $\times 40$.
 6. " " Spines on 7th segment of oviger. $\times 220$.
 7. " " Newly-hatched larva, ventral view. $\times 100$.
 8. " " Tarsus and propodus of leg. $\times 33$.
 9. " " Ganglia and nerves of ventral chain. $\times 8$.

PLATE 27.

- Fig. 10. *Pallenopsis Crosslandi*. Female, side view. $\times 5$.
 11. " " Dorsal view. $\times 5$.
 12. " " Tip of proboscis, end view showing mouth. $\times 10$.
 13. " " Terminal segments of cheliforus, end view. $\times 22$.
 14. " " Head with proboscis, left cheliforus, palp and oviger, and second leg-bearing segment; ventral oblique view. $\times 10$.
 15. " " Palp. $\times 25$.
 16. " " Oviger. $\times 25$.
 17. " " End of 2nd coxal segment of leg, showing gastric diverticulum, muscles, ovary, and oviduct. $\times 16$.
 18. " " Outer edge of thigh, showing tuberculate outgrowths, denticulate spines, and cuticular glands. $\times 40$.
 19. " " A cuticular gland. $\times 350$.
 20. " " Tarsus and propodus of leg. $\times 25$.



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