

FIG. 7. — **a**, *Epigodromia areolata* (Ihle, 1913), ♂ 14.2 x 12.1 mm, New Caledonia, "Vauban", stn DW 1147, 210 m, 28.10.1989: transverse section through gill. (Dromiidae). — **b**, *Hypoconcha parasitica* (Linnaeus, 1763), ♂ 23.1 x 23.3 mm, Florida, off Panacea, coll. M. WICKSTEN: transverse section through gill. (Dromiidae). — **c**, *Paradynomene tuberculata* Sakai, 1963, ♂ 22.0 x 22.8 mm, New Caledonia, SMIB 3, stn 14, 246 m: cleaning setae from hypobranchial wall of right gill chamber. — **d**, *Dromia erythropus* (George Edwards, 1771), ♂ 81.5 x 62.7 mm, St. Croix, Virgin Ids (USNM 72355): cleaning setae from hypobranchial wall of right gill chamber. (Dromiidae). — **e**, *Paradynomene tuberculata* Sakai, 1963, ♀ 21.5 x 21.2 mm, Loyalty Ids, MUSORSTOM 6, stn DW 406, 373 m (MNHN-B 25249): cleaning setae on epipod from left third pereopod. — **f**, *Metadynomene tanensis* (Yokoya, 1933), ♀ 16.2 x 15.3 mm, New Caledonia, SMIB 8, stn DW 198, 414-430 m: long setae from posterior margin of the left scaphognathite. (All pictures taken with scanning electron microscope.)

primitive. He believed that other dynomenids are probably at a more advanced evolutionary state than *Dynomene praedator*, and it's possible that, as yet undiscovered species of "Acanthodromies", might be more primitive than *D. ovata*, so that it is possible to consider the genus *Acanthodromia* as being the link which connects the genus *Dynomene* to the primitive dromiaceans which originated from the homarids. This hypothesis, which now seems rather unlikely, is largely based on the resemblance of dynomenid gill structure to that found in homarids. Clearly BOUVIER considered phyllobranchiate-like gills as being derived from the trichobranchiate condition. The tendency to evolve phyllobranchiate-like gills seems to have occurred independently in the Homolodromiidae, Dynomenidae and Dromiidae since the last common ancestor of the three groups must have had multi-lobed gills.

PEREOPODS

Anterior pereopods: The first pereopods of dynomenids are longer than walking legs, chelate and sexually dimorphic, being larger in males. The meral article is long and trigonal in section, while the carpal article is distinctive in usually having a prominent sharp spur on the inner superior border. This feature is absent in *Metadynomene*, where there are three small tubercles, and in *Acanthodromia*, where the whole limb is spinous. The fixed finger is straight and is armed with from two to eight small teeth often increasing in size distally. The number of teeth on the dactyl is usually less than on the opposing finger. The tips of both fingers are usually dentate. In *Dynomene*, *Hirsutodynomene* and *Acanthodromia* the dactyl is down-curved so that the fingers gape, but in *Metadynomene* and *Paradynomene* the dactyl is essentially straight so there is little gap and the fingers touch for about half their length. Both fingers are hollowed out internally with a bunch of stiff setae inserted near the base of each finger and projecting across the gap between them. In *Dynomene* and *Hirsutodynomene* these setae are very well developed, forming a screen or sieve behind the outer dentate margins. Observations on *D. praedator* show that these setae help to sift out food particles which are passed to the third maxillipeds (see below).

The second through fourth pereopods are well developed walking legs of similar size to the first pereopods or slightly smaller. They tend to decrease in length posteriorly. Plane of movement of the sternal-coxal articulation is anterior-posterior, for the ischial-basis articulation plane of movement is dorso-ventral, the meral-ischial articulation has a small anterior-posterior plane of movement, the carpal-meral articulation is also dorso-ventral, the propodal-carpal articulation moves anterior-posterior, and finally the propodal-dactyl articulation is dorso-ventral. Dactyli are long and curved with their inner margins usually armed with two to six small spines which are probably used to grasp the substrate on which the crabs live. There is no clear pattern of variation in number of spines between the genera. The only exception is *Dynomene pugnatrix* which has ten dactyl spines. This may indicate that it lives in association with a different kind of host or habitat. At least some of the other shallow water species are known to live among corals and coral debris.

Fifth pereopod (Figs 8 a-f, 9 a-f, 10 a-d, 11): Perhaps the most distinctive feature of the Dynomenidae is the very reduced last pair of pereopods which are carried alongside the posterolateral corners of the carapace, above the base of the fourth pereopods. The reduced leg is directed anteriorly. It is commonly stated that dynomenids, like dromiids, carry their last legs in a dorsal or subdorsal position, but this is not correct. This limb cannot rise above the level of the carapace margin because it is too short and relatively immobile and so cannot be described as dorsal or subdorsal. A more accurate description would be that the limb is "horizontal". Most of the scope for movement in this limb is attributable to the coxo-basal article because the remaining joints are scarcely moveable. The basis-ischium articles are fused in all species, and in *Acanthodromia erinacea* and *Paradynomene tuberculata* the merus is also fused to the preceding articles. The inferior distal margin of the merus is hollowed out as in the previous three limbs. However, it is the anterior distal border of the propodus which is extended to form the fixed finger of the subchelate mechanism and when the limb lies in its natural position the dactyl is almost ventral, the opposite of the cheliped. Observations on live *D. praedator* show that these limbs have a very restricted scope for movement: they are only capable of moving in an anterior-posterior plane above the bases of the preceding pereopods. Most of the time they simply lie alongside the posterolateral corner of the carapace, but when the crab moves using its pereopods, they often move at the same time as though they are part of the coordinated pattern of limb movements. The last legs cannot reach above on to the posterolateral corner of the carapace or beneath the crab into the abdominal cavity. Thus they are not capable of carrying a piece of camouflage or performing a grooming role.

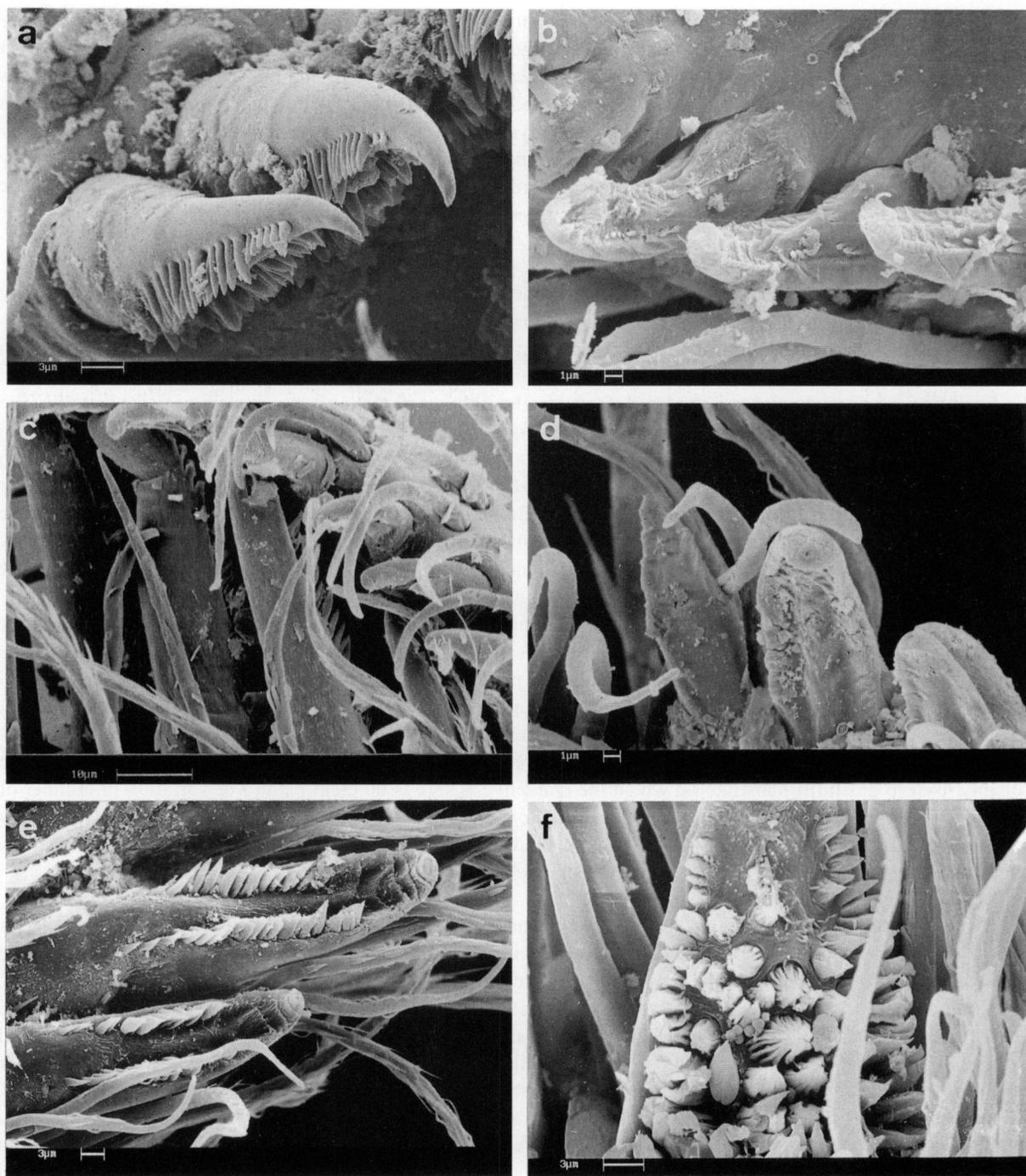


FIG. 8. — **a**, *Dynomene praedator* A. Milne Edwards, 1879, ♂ 9.6 x 7.8 mm, Somalia, Gesira, stn 19, intertidal coral (MZUF): propodal spines from left fifth pereopod. — **b**, *Dynomene praedator* A. Milne Edwards, 1879, ♀ ovig. 9.6 x 7.5 mm, Glorieuses Ids, intertidal: dactyl spines from right fifth pereopod. — **c**, *Dynomene filholi* Bouvier, 1894, ♀ 10.0 x 8.7 mm, Cape Verde Ids, CANCAP, stn 7.125, 85-130 m: dactyl and propodal spines from left fifth pereopod. — **d-e**, *Dynomene pilumnoides* Alcock, 1900, ♀ 12.8 x 10.3 mm, New Caledonia, VOLSMAR, stn DW 7, 400 m: **d**, dactyl spines from left fifth pereopod; **e**, propodal spines from left fifth pereopod. — **f**, *Hirsutodynomene spinosa* (Rathbun, 1911), ♀ 23.8 x 17.8 mm, Cocos Keeling Ids, 0-28 m (WAM 723-89): propodal spine from left fifth pereopod. (All pictures taken with scanning electron microscope.)