

# *Alebion echinatus* Capart from Japanese Waters, with Observations on the Newly Found Male Form<sup>1</sup>

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THE HAMMERHEAD SHARK, *Sphyrna zygaena* (Linné), was reported by Wilson (1932) as infected by a copepod belonging to the Family Euryphoridae, *Alebion crassus* Wilson, at Woods Hole. On the same shark caught off Hamazima, Mie Prefecture, Japan, I found another species of the same genus, *A. echinatus* Capart, which was recently discovered on *S. diplana* in the gulf of Sénégal (Capart, 1953). This species was based on a single female and the male was unknown. As the original diagnosis was rather brief and my collection included a male form, a new description has been prepared for both the sexes.

*Alebion echinatus* Capart, 1953

Capart, A., 1953. Inst. Franç. d'Afrique noire, Bul. 15: 655-656, Fig. 4.

Two females and a male, found on the outside surface of *Sphyrna zygaena* (Linné) (new host), off Hamazima, Mie Prefecture, Japan.

*Female* (Figs. 1a-j, 2a-g): Thickly covered with minute dendritic patterns of dark red, the color appearing uniform over whole dorsal surface to the naked eye; ventral surface much paler. Eye pigment blackish. 11.4 mm.  $\times$  10.4 mm.

Carapace almost half as long as body, wider than long, orbicular, with depressed front and well-rounded sides. Central part considerably raised and rugose on the surface. Frontal plates about half the entire width, slightly arched and with blunt lateral ends. Transverse suture a little undulated and placed just behind the center of carapace. Longitudinal sutures slightly curved laterally both

before and behind transverse one. Two grooves arising from anterior end of each, one narrow, short, extending antero-mesially, the other broader, horizontal, connected with lateral margin of carapace by a curved, diagonal suture. Another pair of grooves extends from the bases of the frontal plates postero-mesially and intersects a short transverse one at anterior one fourth of cephalic area. Eyes at the center of this area. Thoracic area armed with short spinules close to its truncate posterior border on each side. Sinuses deep, obovate, with broad membranes along their lateral edges. Narrow areas just outside them are traversed by longitudinal folds raised above the surface and expanded at the caudal end into oval lobes which cover the posterior openings of the sinuses. Lateral areas relatively broad terminating in blunt lobes which project for some little distance beyond thoracic area.

Fourth thoracic segment with a pair of oval dorsal plates covering anterior half of succeeding segment; the plates separated from each other by a deep, narrow, median crevice. Width of the segment across the plates  $\frac{3}{7}$  that of carapace, and the length inclusive of these  $\frac{2}{3}$  the width. Genital segment large, about half as long as carapace on the midline, and same time as wide on an anterior level. It is convex dorsally, more or less quadrate, with antero-lateral angles slightly produced, and with posterior border emarginate. It is reinforced laterally near the caudal end by triangular lamellae and at the caudo-lateral angles by long lanceolate diagonal processes. Outer and caudal margins of the lamellae, inner margins of the processes, anterior portions of lateral margins and lateral portions of caudal margin fringed with a row of sharp spines. Caudal margin also with a pair of

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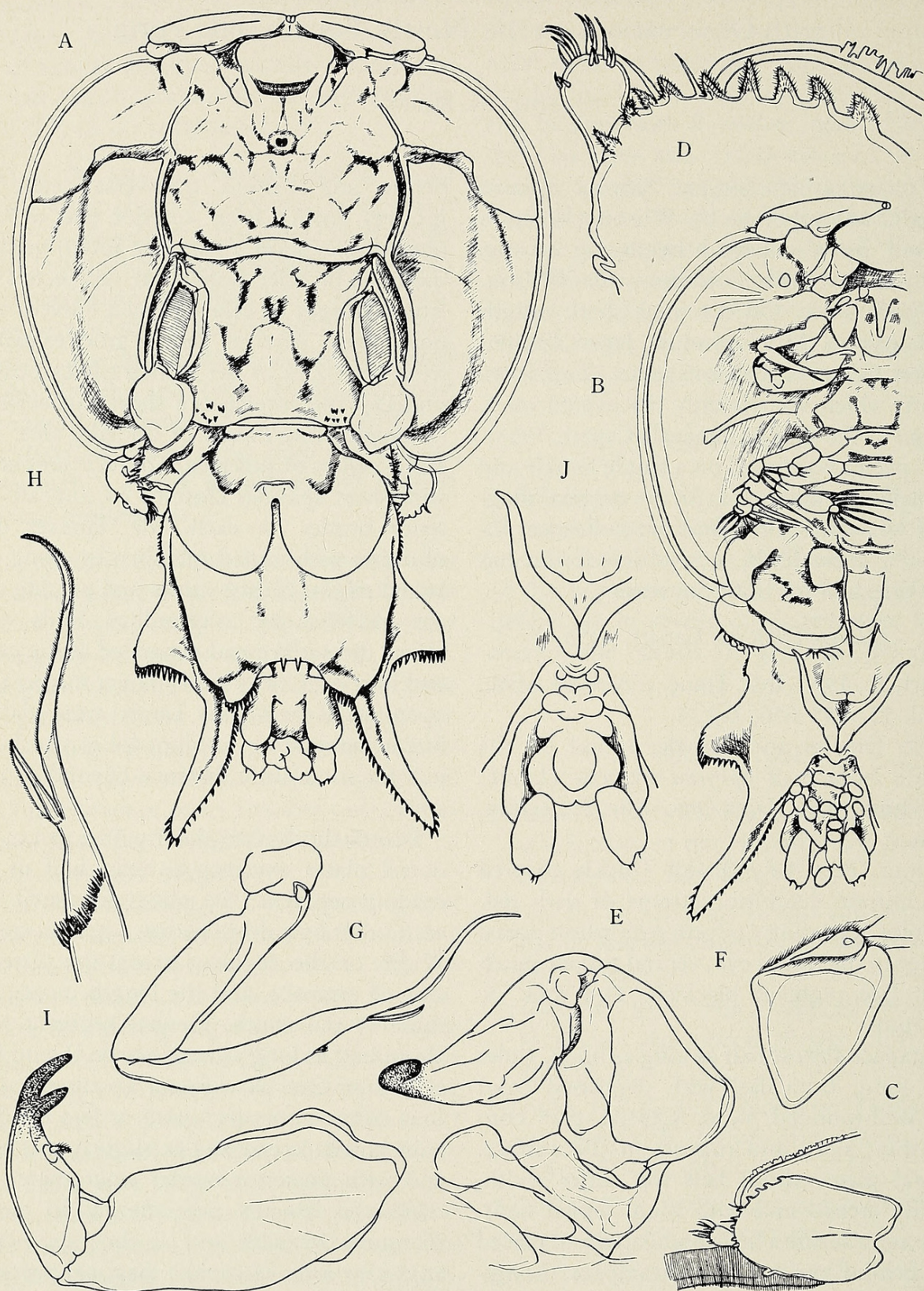


FIG. 1. *Alebion echinatus* Capart, female. A, dorsal aspect; B, ventral aspect; C, first antenna, ventral aspect; D, tip of same, further enlarged; E, second antenna; F, second maxilla; G, first maxilliped; H, tip of same, further enlarged; I, second maxilliped; J, posterior end of body, ventral aspect.

A  $\times 7.1$ , B  $\times 5.9$ , C, F, G, I  $\times 27$ , D  $\times 83$ , E, H  $\times 41$ , J  $\times 9.8$ .



TABLE 1.  
DETAILS OF ARMATURE ON LEGS OF *Alebion echinatus* CAPART

LEG	BORDER	STERNAL PLATE	PROTOPODITE	EXOPODITE			ENDOPODITE		
				I	II	III	I	II	III
I.....	outer inner		1p	c	1H, 1H 3P, 2p			c 3p	
II.....	outer inner	f	f, 1p 1P, f	f, 1H c, 1P	1H c, 1P	1H c, 6P	c 1P	c c, 2P	6P
III.....	outer inner	f	f, 1h, 5h 1P, f	1H c, 1P	c, 1H c, 1P	c, 2H, 1h 5P	c	c c, 2P	4P
IV.....	outer inner			2p, 1h					

Abbreviations: c, row of hairs; f, membranous flange; H, longer spine; h, shorter spine; *H*, modified spine peculiar to the genus; P, longer plumose spine; p, shorter plumose spine. Roman numerals indicate the numerical orders of the legs or of the joints and Arabic the number of spines or other armature present on each.

stouter spines, one on each side of midline. A pair of horn-like spermatophores are attached on the ventral surface close to posterior end, with their apices directing forwards and diverging. Abdomen two-segmented, small, not surpassing the middle of diagonal processes of the preceding segment. First segment is narrowly inserted into median sinus of preceding segment then widens posteriorly, bearing a pair of small oboval, dorsal plates, which are parallel and separated from each other by a deep, wide, median sinus. Ventral surface has inconspicuous, symmetrically arranged tubercles. Second segment is cordiform and covered from above by dorsal plates of the first, beyond which it does not extend.

First antennae with apical joint short, terminating in a swollen, spinulate knob; basal joint obovate and fringed on anterior border by short, conical, thickly ciliated spines as well as by a few setae. Claw of 2nd antennae tapering towards curved blunt apex and without accessory spinule, middle joint conical, and basal one short, broad, with an oval boss on the outside. Mouth tube elongate conical. First maxillae replaced by small, insignificant oval bosses. Second maxillae triangular, placed outside the base of mouth tube. Apical joint

of 1st maxillipeds traversed near the tip by a diagonal row of spinules and terminating in two unequal flagella, both edged with fine pectination. Second maxillipeds have nearly fusiform palm and powerful finger ending in bifurcate tip and carrying a short plumose spinule on inner border. Sternal furca absent.

First three pairs of legs biramous, with both rami two-jointed in first pair, three-jointed in other two. Endopodite of first legs half as long as exopodite, first joint of both rami proportionally much longer than second. Two apical joints of exopodite of second legs short. Distal joint of endopodite of second legs narrow. Exopodite of third legs shorter and narrower than endopodite, apical joint of latter much reduced. Fourth legs are minute papilliform stumps without any distinct articulation. Arrangement of spines and other armature of legs is given in Table 1.

Exopodites of first three legs armed with falciform spines, peculiar to the genus, their distribution on the legs is shown in Table 1. Two spinules on inner margin of apical exopodite joint of first legs edged with a few cirri only. Basal apron combining third legs has two triangular, raised areas on posterior face on each side, outer one of these with a





FIG. 2. *Alebion echinatus* Capart, female and male. A-G, female; A, first leg; B, tip of same, further enlarged; C, second leg; D, third leg, posterior face; E, fourth leg; F, posterior part of body; G, caudal ramus; H-L, male; H, first antenna, ventral aspect; I, second antenna, posterior face; J, same, anterior aspect; K, tip of same, further enlarged; L, second maxilliped.

A, L  $\times 27$ , B, H, K  $\times 83$ , D  $\times 18.6$ , E  $\times 120$ , F  $\times 10$ , G  $\times 34$ , I, J  $\times 47$ .



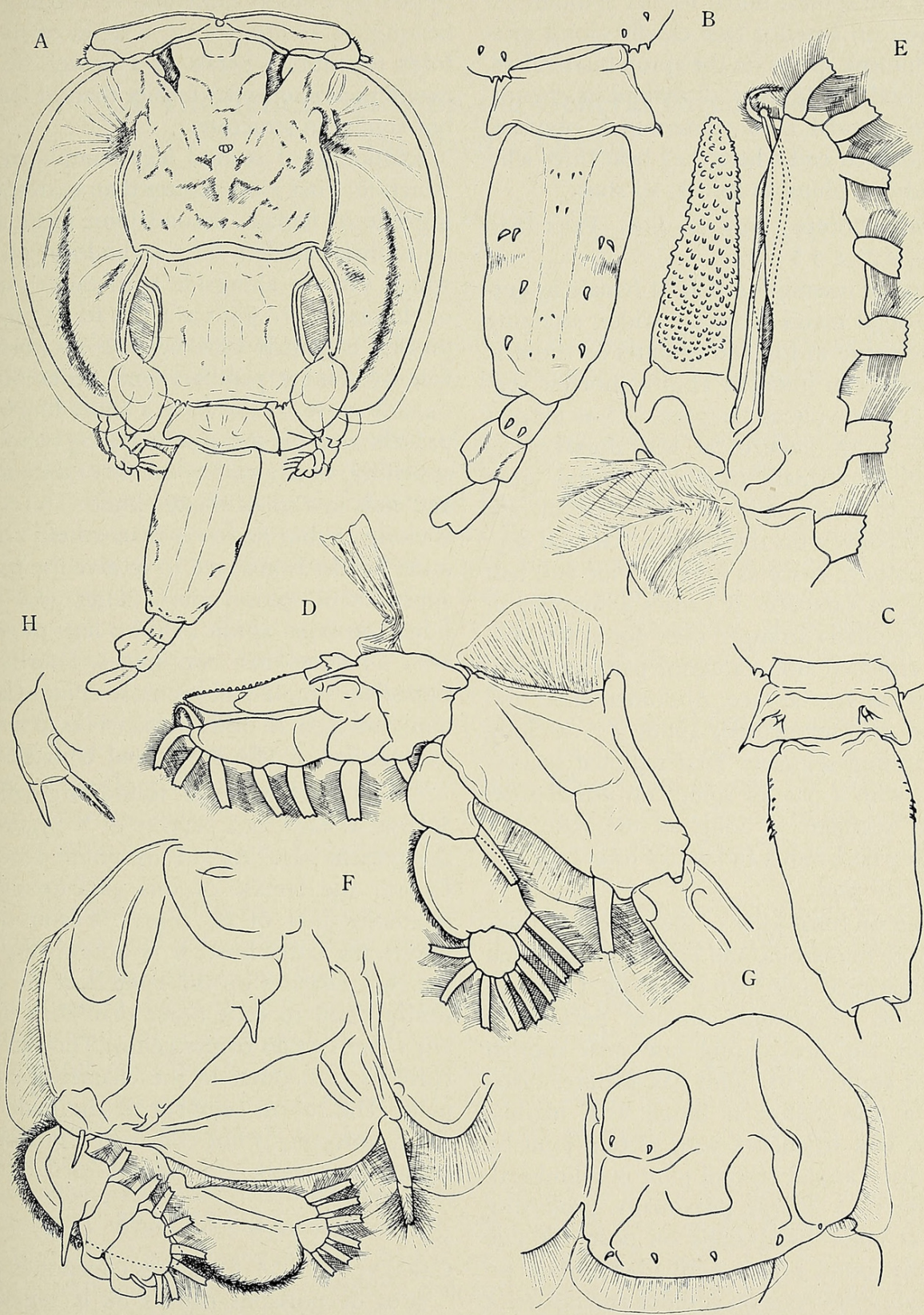


FIG. 3. *Alebion echinatus* Capart, male. A, dorsal aspect; B, free segments of body, dorsal aspect; C, same, ventral aspect; D, second leg; E, same, tip of exopodite, further enlarged; F, third leg, posterior face; G, same, anterior face; H, fourth leg.  
A  $\times 10$ , B, C  $\times 14$ , D  $\times 41$ , E  $\times 83$ , F, G  $\times 34$ , H  $\times 170$ .





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