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NEW MARINE TANAID AND ISOPOD CRUSTACEA
FROM CALIFORNIA.

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The numerous contributions of Tanaid and Isopod Crustacea from the west coast of North America received at the United States National Museum since the publication of Dr. Harriet Richardson's masterly "Monograph on the Isopods of North America," have necessitated an additional report on this fauna. Delays in the publication of this work make it desirable to give status now to the new forms found. The one new genus and new species of Tanaid and the two new genera and five new species of marine Isopods herein described will be more fully discussed and illustrated in a forthcoming monograph.

Order: TANAIIDACEA.

Family: APSEUDIDAE.

Genus: **Dalapseudes**, new.

Second antennae without scale. Exopods present on both pair of gnathopods. Epipodytes present on last five pairs of legs. Three pairs of pleopoda are present, the branches of which are well developed. Eyes present. Abdomen consists of six distinct segments. Mouthparts well developed. Unique.

Type: *Dalapseudes pedispinis*, new species, from Laguna Beach, California.

Dalapseudes pedispinis, new species.

Body elongated, narrow, gradually tapering posteriorly.

Head with frontal margin produced into a semiconvex, subtriangulate median rostral process between the basal joints of the first antennae. Eyes large, reddish brown, occupying ocular processes articulated to the head. The first pair of antennae has a peduncle of two articles, the basal one relatively stout and slightly longer than the distal. The biramosse flagellum consists of a superior branch composed of seven slender articles, and an

equal inferior branch composed of seven articles; all the joints of the antennae are set with long hairs. The greater antennae are about as long as the head. The second antennae extend slightly beyond the second joint of the peduncle of the first antennae and consist of a peduncle of two slender articles and a flagellum of four rings. The peduncle of the second antennae is sparsely set with long hairs but there is no scale present.

Thorax: The first segment of the thorax is coalesced with the head, forming a carapace; the second is a little shorter than those following, the third and fourth are subequal, each being a little longer than the second; the fifth, sixth and seventh are about equal, each being about one and one-half times as long as the second segment. The lateral margins of the third, fourth, fifth, sixth and seventh segments are distinctly cleft and the post-lateral angles of the seventh segment are decidedly produced posteriorly. Epimera dorsally distinct on the last four segments, extending the posterior half of the lateral margins.

The gnathopods are slender, in the normal position curving over the mouthparts, not extending beyond the anterior margin of the head. The hand is chubby, the thumb being thick and bluntly pointed and the finger slender and decidedly curved, the tip being quite pointed and the inner margin finely serrate. The second, third, fourth, and fifth pairs of legs are similar in structure, being relatively weak and gradually decreasing in size posteriorly. The last three joints of each leg are flattened, blade-shaped, with the inner margins densely set with long spines, the terminal joint being tipped with three distinct spines with lesser spines interspersed. Epipodytes are present, they spring from the basal joint of the leg and are directed obliquely posteriorly, the distal ends reaching almost to the median ventral line. Each epipodyte is shaped like a long slender blade, terminating in a subtriangulate point, the three posterior epipodytes are narrower.

Abdomen: All six segments are distinct, the first, second and third are narrow, subequal, the fourth and fifth are wider, subequal, having the postlateral angles posteriorly produced. The telson is shield-shaped, having the posterior margin bluntly rounded. The uropoda arise from the ventral surface of the telson; the first joint is rudimentary, the second is a squarish, flat blade, bearing a few fine hairs along the margin. Three pairs of pleopoda are present and have the branches well-developed.

The holotype was collected at Laguna Beach, California, by Dr. William A. Hilton, who donated it to the collections of the United States National Museum.

Order: ISOPODA.

Superfamily: CYMOITHOIDEA.

Family: ANTHURIDAE.

Genus: *Edanthura*, new.

First five segments of abdomen distinct in both sexes. Flagella of both pairs of antennae rudimentary in both sexes. Mouthparts well-developed, with articulation distinctly different from that of the other genera of this family.

Type: *Edanthura linearis*, new species from Laguna Beach, California.

***Edanthura linearis*, new species.**

Body narrow, subcylindric, linear, surface smooth, color light yellow.

Head rectangular, longer than wide with frontal margin with a distinct median point; anterolateral angles decidedly produced terminating in a point that reaches almost to the distal end of the peduncle of the first antennae. Eyes distinct, elliptical, set obliquely in the anterolateral angles of the head. The first antennae consist of a peduncle and rudimentary flagellum. The second antennae are similar with a slight difference in size. Mouthparts well-developed, unique.

Thorax: The first six segments are squarish, the first, second and third being about equal, the fourth, fifth and sixth being about equal, each of the latter being slightly longer than any of the former, the seventh segment is about one-half as long as the first. The first and second segments are narrower posteriorly with the line of segmentation emphasized. Legs: the first pair are geniculate, relatively short, stout, subchelate, having the first joint long, produced outward like a shoulder, the second resemble a stout forearm, the third is quite short, the fourth, fifth and sixth taper and terminate in a curved pointed dactyl. Four pairs of marsupial plates are present, they are very thin, transparent, squarish with the free edges very slightly rounded at the corners.

Abdomen: This consists of six distinct segments and is slightly longer than the last two thoracic segments taken together; the first segment is hidden dorsally by the seventh thoracic segment being distinguishable only laterally and ventrally; the second and third segments are narrow, similar and subequal; the fourth segment is similar but slightly wider than the preceding segment; the fifth segment resembles the fourth, the telson is as long as the outer uropoda and is V-shaped and fringed with hairs. Uropoda: The superior branch of the uropoda overarch the telson, but do not quite meet in the dorsal center. they are somewhat convex and are directed obliquely sidewise, combining with the inferior uropoda and other features of the telson in creating a fanlike aspect. There is a distinctly cleft incision on the extreme posterior margin, which gives the superior uropod a decidedly bilobed aspect; the inferior branch of the uropod is as long as the telson, relatively narrow basally, widening distally, the posterior margin being straight; the first joint terminates about the posterior margin of the superior uropod. The uropoda and telson are heavily fringed with long fine hairs. The pleopoda are slender and heavily fringed with fine hairs.

This species was collected at Laguna Beach, California, by Dr. William Hilton, who with characteristic generosity donated it to the collections of the United States National Museum.

Superfamily: SPHAEROMINAE.

Genus: EXOSPHAEROMA.

***Exosphaeroma aphrodita*, new species.**

Animal exquisitely sculptured and ornamented, iridescent pearly, fairy-like in its ethereal beauty.

Head strongly convex, anterior margin rounded and ornamented by a

prominent median tubercle on each side of which is a lesser elongate tubercle; along the posterior margin there is a row of five, similar, subequal elongate tubercles. Eyes prominent, elliptical, composite, occupying the postlateral angle of the head. The first antennae have the two peduncular joints enlarged, stout, subequal, and a flagellum of four short joints which taken together are about as long as the second peduncular joint. The first antennae extend about to the anterior margin of the first thoracic segment. The second antennae are as long or a trifle longer than the first antennae. The mouth parts are typical *Exosphaeroma*; the second third and fourth articles of the palp of the maxillipeds are very decidedly produced.

Thorax: The first segment is longer than the head and bears a transverse row consisting of five similar, equal, hemispherical tubercles along the anterior margin, evenly spaced, each one in line with the elongate tubercles of the head; there is also a transverse row of seven similar hemispherical tubercles along the posterior margin of this segment; the second, third and fourth segments are similar and subequal, each bearing a transverse row of seven similar hemispherical tubercles placed in line with the posterior row of tubercles of the first segment and situated along the posterior margins of the respective segments; the fifth and sixth segments are slightly longer than the preceding ones, subequal, each ornamented with a row of seven hemispherical tubercles placed as on the preceding segments; the seventh segment is longer in the median area and has the posterior margin produced to a prominent median tooth giving the segment a triangulate effect; on either side of this median tooth separated by a small recurvate space is a small tooth which in turn is separated by a wider recurvate space from another tooth intermediate in size. The epimera are well developed, closely appressed to the segments, and having the dorsal surface decidedly concave forming a groove, the epimera of the fifth and sixth segments have the outer marginal edge decidedly curled over and inward; the sixth epimera are decidedly produced posteriorly. The legs are ambulatory, similar and subequal.

Abdomen: This consists of two closely fused segments; the first segment resembles the seventh thoracic segment having the posterior margin produced to a median tooth and with two lesser teeth on each side as on the seventh segment. The telson is produced triangulately with the apex slightly rounded. It is elevated rooflike in the median dorsal line and has the sides sloping and terraced; there are four small dentitions in the anterior region forming a V-like design; posterior to these are eight smaller dentitions forming a wider V; succeeding this is a prominent line of suture roughly paralleling the lateral margins of the segment; there is a second shorter, less distinct line of suture close to the lateral margin. These suture lines unite in a tridentate pattern near the apex of the telson. Pleopoda one, two and three bear no stylet, are similar, subequal and heavily fringed with hairs. Pleopoda four and five have subequal, ovate, fleshy branches with transverse ridges. Pleopoda are identical in both sexes. The uropoda arise at the base of the telson and are closely appressed thereto; they are very much expanded, being more than twice as wide distally as basally; the inner branch has the distal margin bluntly rounded, the outer branch produced to

a slightly triangulate apex and is slightly cleft or channeled on each side midway between the apex and the lateral margins. The outer lateral margin of the outer branch of the uropoda is strongly bent upward and curved over inward upon the dorsal surface.

The type and additional material were collected at La Jolla, California, and are in the collections of the United States National Museum. This species is at once distinguished from all described Sphaerominae by its exquisite sculpturing and ornamentation. Out of many thousands of specimens of Isopoda which I have examined, this species is probably the most beautiful.

DYNAMENELLA Hansen 1905.

Dynamenella conica, new species.

Body oval, convex, surface coarsely granular, ground color yellowish dusted with black. Head about twice as wide as long, with frontal contour relatively straight, heavily keeled, below which the margin is narrowly produced with the frontal edge marked by a narrow, median truncate point, on either side of which is a U-shaped incision, followed by a straight area that extends to the anterior part of the eye. The first antennae have a peduncle of three stout, subequal articles and a flagellum of three slender articles, distally tipped with a few hairs; it extends almost to the anterior margin of the third thoracic segment. The second antennae have a peduncle of five, slender, subequal articles and a flagellum of nine fine rings, each bearing an almost tuft of hairs, and extending to the anterior margin of the fourth thoracic segment. The second, third and fourth articles of the palp of the maxillipeds are produced inwardly into lobes. The mandible has a palp of three articles.

The first segment of the thorax is about $1\frac{1}{2}$ times as long as any of the following segments which are subequal. The first segment has the lateral margins heavily ridged; the epimera occur on the second to seventh segments inclusive and have the outer angles rounded. The legs are normal; the first three pairs are directed anteriorly, the last four are directed posteriorly. The distal three joints of each leg are somewhat sparsely and irregularly set with fine short hairs.

The abdomen is composed of two segments; the penultimate segment does not show lines of fusion; it has the median area roundly produced, with a strong ridged carination along the median posterior margin, on either side of which is an acute incision forming a point, thence strongly arcuate with the extreme postlateral angle produced to a rounded point, resembling the epimera of the seventh thoracic segment. The telson is strongly convex, triangulate, with the postlateral margins infolding, funnel-like around a narrow sub-elliptical aperture, which is incomplete on the ventral side; the entire posterior margin is heavily carinated, the aperture margin being finely crenulate also. The dorsal surface is ornamented by a pair of strong ridges that extend almost to the anterior end of the funnel like aperture. These ridges are separated by a deep groove-like depression and each is followed by a row consisting of three convex tubercles, the central tubercle being minutely larger and equidistant from the other two, the three forming

a line equal in length and depth to the above cited ridges, from which they are separated by a deep groove-like depression equal to the median depression. These rows of three tubercles are followed by a less distinct row consisting of two small indistinct tubercles the anterior one being near the base of the uropoda, the posterior being on a line with the middle tubercle of the adjacent row. The uropoda consist of a brief, swollen peduncle and two similar subequal, subovate branches which extend slightly beyond the posterior margin of the telson. The pleopoda are normal.

Both sexes of this species are known. They are very similar, differing only in that the second pleopoda of the male bears a stylet, and the brush-like tufts of setae on the flagellum of the antennae of the male are more pronounced, while the tubercles on the abdomen of the female are weaker and sometimes relatively inconspicuous but always distinct.

The present species is the fourth representative of this genus to be reported from the West Coast of North America; incidentally it may be noted that Monterey Bay, California, the type locality of the three previously described species, is also the first locality from which the present species is recorded. In June, 1905, Dr. J. E. Benedict, of the United States National Museum secured two specimens at Pacific Grove, Monterey Bay, Cat. No. 50413, U. S. N. M., but owing to their imperfect condition I have selected as type a specimen from the material secured by the United States Bureau of Fisheries steamer *Albatross* during the biological explorations of San Francisco Bay, 1912. The type comes from Red Rock, middle San Francisco Bay, Aug. 3, 1912, Cat. No. 50414, U. S. N. M. Additional material secured by the same cruise is in the collection of the United States National Museum as follows: Cat. No. 50415, Key Route Pier, Aug. 3, 1912, 1 specimen; Cat. No. 50416, Sausalito Ferry building, on pile, 1 sp.; Cat. No. 50417, Bonita Point, between tidemarks, Aug. 1, 1912, 1 specimen.

Dynamenella conica is at once distinguished from the other members of the genus by the rows of tubercles on the telson.

SPHAEROMINAE EUBRANCHIATAE.

Clianella, new genus.

First antennae with basal articles swollen, sculptured, dovetailing with the sculptured, carinated frontal margin of the head. Basal joint of antennulae normal, not expanded in a free plate. Without processes on thorax. Abdomen with apex bisected by a deep channel which widens at the anterior end into a crescent surrounding an overhanging blunt tooth. The postlateral wall of the telson is produced to a greater depth below the uropoda than above and is broadly thickened and rounded and distinctly excavated. The uropoda are subsimilar, extending beyond the telson which they entirely surround except in the median area, where their inner margins prolong the channel; the anterolateral margin of the outer blade slightly surrounding the inner blade. The pleopoda one, and pleopoda two, each bear an appendix masculina. The endopoda of pleopods three is one jointed.

Genotype.—*Clianella elegans*, collected at La Jolla, Calif.

***Clianella elegans*, new species.**

Body rather broadly elongate, ovate, moderately vaulted.

The head is nearly twice as wide as long, is wider posteriorly and has the frontal margin produced in a rimlike carination which is sculptured frontally to dovetail with the antennae. The eyes are very large, round, occupying the entire anterolateral areas. The superior antennae arise beside the clypeus, have the first joint elongate, swollen, sculptured, the second joint also swollen and sculptured but not quite half as long as the first joint, the third joint is about as long as the second, but much slenderer, and a flagellum of about fourteen subequal rings, which reach about midway the first thoracic segment. The inferior antennae has the first, second and third joints short, subequal, the fourth joint twice as long as the third, the fifth joint slightly longer than the fourth and a flagellum of sixteen subequal rings each of which bears a small brush of setae on the anterior distal margin. The second antennae reaches not quite to the posterior margin of the third thoracic segment.

The second, third and fourth articles of the palp of the maxillipeds are produced into lobes.

The first thoracic segment is about as long in the median area as the head and has the anterolateral areas decidedly convex and the anterolateral angles produced closely around the ocular lobes. The second to seventh segments inclusive are subequal. The epimera are completely fused with the respective segments. The seventh thoracic segment bears a median transverse row of closely spaced granulations.

The first abdominal segment is approximately one and one-half times as wide in the median area as the seventh thoracic segment. It has the lateral area produced a trifle beyond the thoracic marginal line and curiously thickened ventrally. A vague minute line in the anterior area just inside the lateral angulation of the seventh thoracic segment indicates coalesced segments, this line vanishes in the median lateral region but reappears indistinctly in the central region. A second, pronounced line indicating coalescence occurs on the posterior lateral region and follows the curved posterior margin of the first abdominal segment and vanishes rather abruptly. Two rows of alternately spaced, somewhat larger granulations transverse this segment. The terminal segment is subtriangulate with the anterior two-thirds moderately convex and divided into lobes by a moderate median longitudinal depression. The apex is bisected by a deep channel which widens at the anterior end into a crescent which surrounds an overhanging blunt, round, toothlike projection. The incision is quite deep, being nearly one-third as long as the telson. The margins of the channel are finely crenulate. The postlateral third of the telson is a sloping border definitely, closely appressed to the uropoda and slightly ridged at this point, viewed ventrally this postlateral wall of the telson is produced to a greater depth below the uropoda than above; this produced part has the outer wall convex, widening and thickening toward the base of the uropod, ridged along the extreme ventral margin and thence the internal wall is slightly rounded and excavated to form the pleopod cavity. The first and second pairs of pleopoda each bear an appendix masculina. The

third pleopoda have the exopod one-jointed, the fourth pleopoda have a leaf-like exopod and an endopod marked by heavy transverse folds, the fifth pleopoda have a leaf-like exopod and the endopod more heavily marked by transverse folds than that of the fourth endopod. The uropoda are sub-similar, arise at the base of the telson and are closely appressed thereto, they are larger, very much expanded, being one and one-half times as wide distally as basally, broadly rounded distally with the margin finely crenulate. They extend beyond the telson a distance approximately equal to two-fifths the length of the sinus, but their respective inner margins continue the marginal wall of the sinus, thus accentuating the channel. The outer branch viewed ventrally is decidedly convex, its anterior lateral margin slightly over-arching the inner blade.

Six specimens were collected from the debris from bunches of mussels along the outer ledge of rocks north of Scripps Institution for Biological Research, La Jolla, California, Oct. 23, 1915. The type, Cat. No. 50421, U. S. N. M., and two paratypes are in the collections of the U. S. National Museum; three additional paratypes are in the collections of the Scripps Institution for Biological Research. Another representative of the same species was collected at Point White, San Pedro, California, May 18, 1919, by Mr. E. P. Chace and donated to the U. S. National Museum, Cat. No. 50422.

Superfamily: IDOTHEOIDEA.

***Erichsonella pseudocolata*, new species.**

Body rectilinear, about three and a half times as long as wide. Head wider than long, with frontal margin produced to a depressed blunt triangular median rostrum between the antennal foramina and with the anterolateral angles produced hornlike, somewhat flaring; the median lateral margin is roundly excavate and the postlateral angle is occupied by the small spherical eyes; the median dorsal surface of the head is convex and produced anteriorly into two conical, forward-projecting, hornlike tubercles which extend beyond the median frontal margin of the head. The first antennae are short reaching only to the distal end of the second joint of the second antennae and have the basal joint entirely and the second joint almost entirely hidden, the third joint is very swollen and has its distal margin produced resembling the rostral joint; the fourth and fifth joints are slenderer, subequal, wider distally and the flagellum is clavate but bearing 7 or 8 indistinct minute markings of coalescence, and a fringe of hairs on the distal margin. The second antennae are very conspicuous, being nearly half as long as the body and decidedly geniculate, the first article is quite inconspicuous, the second article is quite broad, widening anteriorly and having the distal margin recurvate like flower petals, the third article is about as long as the second, but is flattened, the fourth is twice as long as the third, the fifth is about as long as the third, all have the distal margin recurvate and produced into points; the flagellum is clavate, about as long as the fourth joint of the peduncle and has a fringe of fine hairs on the distal end.

Thorax: The first thoracic segment is somewhat shorter in the median

area than any of the following and has the median anterior margin slightly bilobate and the anterolateral angles decidedly acutely produced and projecting with the apex notched and the entire process shining black, giving the appearance of huge triangulate eyes. The median dorsal line is produced into two ridgelike tubercles placed one behind the other. The second, third, fourth, fifth and sixth thoracic segments are about equal, the seventh segment is slightly shorter than those preceding; each has the median dorsal line ridged and a single tubercle on the median posterior margin. The epimeral plates are very small, bilobate, scarcely visible dorsally on the first segment, but are distinct on the second to seventh segments inclusive. Those of the second, third and fourth segments are small, triangulate, and placed under and occupy part of the anterior half of the margin of the segment, the fifth epimeron is slightly wider and situated a little more posteriorly, the sixth and seventh epimera are quite large, occupying the entire posterior half of the margin of their respective segments and being longer and directed backward, whereas the other epimera are quite short and are directed straight outwards. The legs are all ambulatory, similar and subequal and have the dactyli biunguiculate.

The abdomen is vaulted, shield-shaped, and is composed of a single segment but bears a decided lateral incision and single distinct, incomplete suture line indicating the fused first segment; this part is quite narrow in the lateral region but has the central portion strongly ridged and gently produced, being nearly five times as long in the median dorsal line as in the lateral line; three slight but distinct tubercles along the median ridge indicate the areas of the completely fused second, third, fourth and fifth segments; the telson is typically shield-shaped with the central area vaulted and the suggestion of a median line extending clear to the apex of the posterior end; the posterior margin is produced into a median point which is strong and acute; extending decidedly beyond the lateral angles which are almost absolute right angles. The uropoda have the apical joints triangulate, about one-fifth as long as the peduncular joint, and each uropod bears two distinct nodules along the line of union of the two joints; the peduncular joint has the free lateral margin heavily grooved. The species may be at once distinguished from all the American *Erichsonellas* by its huge and curious false eyes; also by the presence of a lateral incision on the abdomen.

The type, a unique specimen, Cat. No. 50420 U. S. N. M., comes from San Pedro, California, and was collected by Mr. E. P. Chace. It is interesting to note that this is the first *Erichsonella* reported from the West Coast of North America, the three other American members of this genus being from the East Coast.