

On *Oswaldella billardi* Briggs, 1938 and *O. erratum* spec. nov., two antarctic hydroid species (Cnidaria, Hydrozoa).

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The type material of *Oswaldella billardi* Briggs, 1938, has been re-examined and a complete description and figures are presented. The study of that material has allowed to reconsider the systematic position of all the material previously assigned to *O. billardi* and to determine that part of it belongs to another species. Since it is clearly different from the remaining species of the genus, it is described as *Oswaldella erratum* spec. nov.

Resumen: Se ha revisado y redescrito el material tipo de *Oswaldella billardi* Briggs, 1938. Su estudio ha permitido reconsiderar la posición sistemática de todo el material anteriormente asignado a *O. billardi* y, así, determinar que parte del mismo pertenece a otra especie. Ya que dicha especie es claramente diferente de las otras especies del género, se describe como *Oswaldella erratum* spec. nov.

Introduction

In a comprehensive study of antarctic hydroids that we are carrying out, the type material of *Oswaldella billardi* Briggs, 1938, has been re-examined. The description and figures given by Briggs (1938) are so poor that we considered it necessary to study the type material in order to give a complete re-description and more suitable figures and, in that way, to confirm the identification of the large "Polarstern" material as *O. billardi* by Peña Cantero, Svoboda & Vervoort (1997). The study of the type series revealed that the "Polarstern" material, as well as some of the material identified as *O. billardi* by previous authors, actually belongs to another species, distinctly different from the remaining species of the genus. It is described below as *Oswaldella erratum* spec. nov.

Description of the species

Oswaldella billardi Briggs, 1938 (fig. 1)

Oswaldella billardi Briggs, 1938: 40, fig. 3, pl. 15 fig. 1; Naumov & Stepan'yants, 1962: 98-99; 1972: 53-54, fig. 14c; Stepan'yants, 1972: 74.

Oswaldella billardi billardi; Stepan'yants, 1979: 113, pl. 21 fig. 3a, b.

Not *Oswaldella billardi*; Blanco, 1984: 45-46, pl. 41 fig. 95, pl. 42 figs 96-97 (= *Oswaldella shetlandica* Stepan'yants, 1979 p.p.; *Oswaldella erratum* spec. nov. p.p.); Blanco & De Redolatti, 1977: 1-8, pls 1-4 (= *Oswaldella shetlandica* Stepan'yants, 1979); Broch, 1948: 13-16, fig. 4b; Peña Cantero, Svoboda & Vervoort, 1997: 349-353, figs 2, 13b (= *Oswaldella erratum* spec. nov.).

Not *Oswaldella billardi shetlandica* Stepan'yants, 1979 (= *Oswaldella shetlandica* Stepan'yants, 1979 p.p.; *Oswaldella erratum* spec. nov. p.p.).

Material examined.— Australasian Antarctic Expedition 1911-14, Stn 7, 65°42'S 92°10'E, 60 fms, 21.i.1914, bottom: small rocks with red algae. (Aust. Mus. no. Y.637). Numerous colonies with stems up to 90 mm high. XI Soviet Antarctic Expedition, Davis Sea, Stn 5 sample 44, 8.i.1966, 30 m depth, a few stems up to 90 mm high (material studied by Stepan'yants, 1972).

Description.— Colonies brown, composed of unbranched and monosiphonic stems; some stems, however, with a few stolons at basalmost part. Hydrorhiza up to 15 mm diameter, consisting of many hydrorhizal tubes. Occasionally hydrorhizal stolons of several stems interwoven, forming a more or less common mass.

Stems divided into internodes; however, division obscure in distal part of stems, where nodes can be indistinguishable. Stem internodes provided with apophyses (one to six per internode; with exception of one or two internodes at base of stem that have none). Apophyses alternately arranged in one plane and directed upwards at 45° (fig. 1b).

Cauline apophyses giving rise to hydrocladia; apophysis and first hydrocladial internode distinctly separate (fig. 1b). Cauline apophyses provided with two nematophores, each emerging through a perisarc hole situated in axil of apophysis and cauline internode (fig. 1b).

Hydrocladia bifurcate; branching at first hydrocladial internode, giving rise to two secondary hydrocladia (fig. 1a). Hydrocladia long, with up to 18 hydrothecae.

Hydrocladia divided into homonomous hydrothecate internodes (fig. 1a). Each hydrocladial internode normally with one hydrotheca and two nematophores (fig. 1c-f): one naked, mesial superior emerging through a circular perisarc hole directly behind free part of adcauline hydrothecal wall; the other mesial inferior, provided with a rudimentary, scale-shaped nematotheca placed on distal part of distinct elevation of internode. Hydrotheca large and deep, placed on distal half of internode (fig.

Table 1. Measurements (in μm) of *Oswaldella billardi*.

Hydrothecae	
length of abcauline wall	371-416
length of free part of adcauline wall	52-85
diameter at rim (lateral view)	150-156
diameter at rim (frontal view)	163-195
Length of nematotheca	39-65
Hydrocladial internodes	
length	836-1148
diameter under hydrotheca	180-262
diameter under nematophore	148-197
Diameter of stem	262-312
Gonothecae	
length of male gonotheca	1033-1148
maximal diameter of male gonotheca	279-295
diameter at rim	213-262
length of female gonotheca	1197-1312
maximal diameter of female gonotheca	640-771
Nematocysts (microbasic mastigophores)	
larger size group	12.6-14 $\times$ 3.5-3.9
smaller size group	7-7.7 $\times$ 2.1

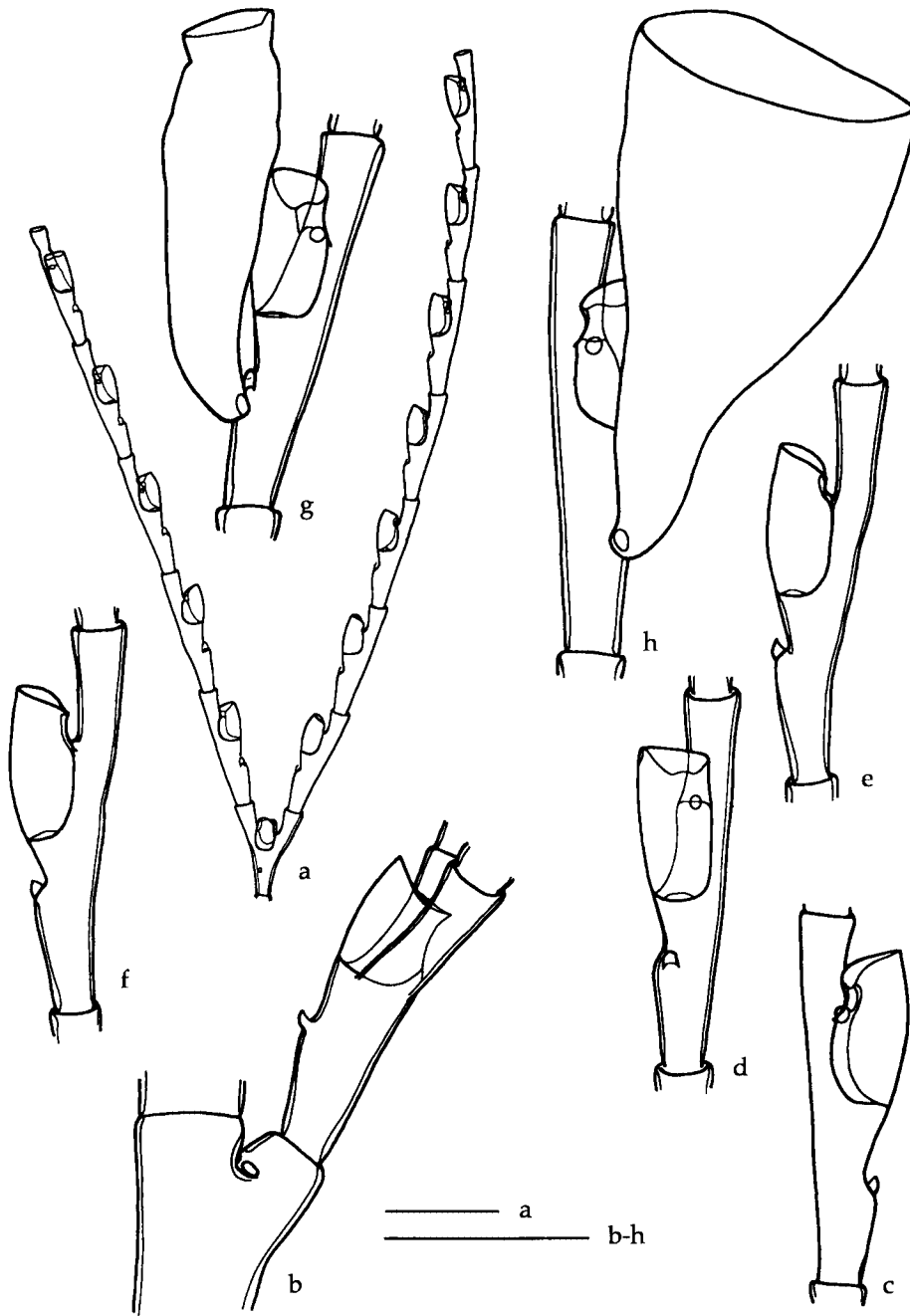


Fig. 1. *Oswaldella billardi* Briggs, 1938; a, hydrocladial branching and hydrothecal disposition; b, cauline apophysis showing axillary nematophores and first hydrocladial internode; c-f, hydrocladial internodes with hydrotheca, mesial superior nematophore and mesial inferior nematotheca; g, hydrocladial internode with male gonotheca; h, hydrocladial internode with female gonotheca. Scale bars: a = 1 mm; b-h = 500 μ m. (All the drawings from the type material).

1c-f). Hydrothecal length increasing along hydrocladia; for example, length of abcauline wall may be 371 μm in first unforked internode and 416 μm in sixth. Abcauline hydrothecal wall slightly convex; adcauline wall free for $1/3-1/4$ of its length (fig. 1c, e-f). Abcauline wall slightly longer than adcauline one; hydrothecal aperture slightly directed adcaudally (fig. 1c-f).

Forked hydrocladial internodes (fig. 1a-b) provided with one hydrotheca in axil of bifurcation and three nematophores: one mesial inferior provided with a reduced, scale-shaped nematotheca and two naked nematophores, one on each branch of the internode and emerging through a perisarc hole situated behind free part of adcauline hydrothecal wall.

Gonothecae inserted on hydrocladial internodes under mesial inferior nematophore. Male gonotheca elongated sac-shaped (fig. 1g), tapering towards base; distal part contracted, aperture placed at distal part of a short, wide neck. Female gonotheca (fig. 1h) inverted cone-shaped with large circular aperture in flattened top.

For measurements see table 1.

Remarks.— The examination of the type series of *Oswaldella billardi* made it possible to reconsider the systematic position of all the material previously assigned to that species. Peña Cantero, García Carrascosa & Vervoort (1995) already removed some material formerly brought to *O. billardi*. This included the material placed in *O. billardi* by Blanco & De Redolatti (1977), part of that ascribed to the same species by Blanco (1984) and partly that described as *Oswaldella billardi shetlandica* by Stepan'yants (1979). All this material was and still is considered to belong to *Oswaldella shetlandica* Stepan'yants, 1979 [for a full description and discussion of this species see Peña Cantero et al. (1995)].

Peña Cantero, Svoboda & Vervoort (1997) identified as *Oswaldella billardi* material from several antarctic expeditions with R.V. "Polarstern" which agreed so well with *O. billardi* that, at that time, it was considered to belong to that species. The study of the type material of *O. billardi* has completely changed that idea, as significant differences were observed between the "Polarstern" material and the type of *O. billardi*, allowing us to consider both as different species. As the material described by Peña Cantero et al. (1997) also differs distinctly from the remaining species of *Oswaldella* it is considered to represent a species new to science, *Oswaldella erratum* spec. nov. The differences between both species will be presented below, along with the discussion of material formerly assigned to *O. billardi* but that we think must also be brought to *O. erratum* spec. nov.

We have re-examined part of Stepan'yants' (1972) material of *Oswaldella billardi* and it unquestionably belongs to this species. Although we have not examined the colonies of *O. billardi* mentioned by Naumov & Stepan'yants (1962; 1972), it was considered conspecific with *O. billardi* by Stepan'yants (1979), that author bringing together the material studied by Naumov & Stepan'yants (1962; 1972) and that studied by Stepan'yants (1972).

By the presence of high hydrothecae, infrathecal scale-shaped nematotheca, cauline apophyses with two axillary nematophores emerging through single perisarc holes, and monosiphonic stems divided into internodes, *Oswaldella billardi* is allied to *O. rigida* Peña Cantero, Svoboda & Vervoort, 1997 and *O. incognita* Peña Cantero, Svoboda & Vervoort, 1997; with the latter it also shares the presence of secondary hydro-

cladia and the angle of c. 45° between the cauline apophyses and the stem. There are, nevertheless, important differences with these species. In both *O. rigida* and *O. incognita* there is no node between cauline apophyses and hydrocladia and the hydrothecae are situated in the middle of the hydrocladial internodes. Moreover, in *O. rigida* the angle between cauline apophyses and stem is c. 90°, there are hydrocladia up to the third order, and the perisarc is strongly developed. Finally, they differ in the shape of the hydrotheca, that of *O. rigida* and *O. incognita* being much shorter with only a small portion of the adcauline hydrothecal wall free and, in *O. rigida*, with an adcauline elevation at the hydrothecal aperture.

Oswaldella billardi has larger differences with the remaining species of the genus. Those differences concern hydrothecal shape, absence of infrathecal scale-shaped nematotheca, number of axillary nematophores, etc.

Ecology and distribution.— *Oswaldella billardi* is a shelf species. It has been recorded from 7 m (Stepan'yants, 1972) to 206 m depth (Naumov & Stepan'yants, 1962) on bottoms composed of small rocks with red algae (Briggs, 1938), sand and boulders (Naumov & Stepan'yants, 1972) and rocks, pebbles, sand and mud (Stepan'yants, 1979). Fertile colonies were found in November and January (Stepan'yants, 1979) and in January (Briggs, 1938).

Oswaldella billardi seems to be endemic in East Antarctica. The type locality is 65°42'S 92°10'E in the Davis Sea (Briggs, 1938), where it was rediscovered by Stepan'yants (1972). It has also been reported off Queen Mary Coast and Enderby Land (Naumov & Stepan'yants, 1962) and from south of Rostand Island, off Adélie Coast (Naumov & Stepan'yants, 1972).

Oswaldella erratum spec. nov.

Oswaldella billardi; Broch, 1948: 13-16, fig. 4b; Peña Cantero, Svoboda & Vervoort, 1997: 349-353, figs 2, 13b.

Oswaldella billardi shetlandica p.p. Stepan'yants, 1979: 114, pl. 21 fig. 3b, c (part belongs to *Oswaldella shetlandica* Stepan'yants, 1979).

Oswaldella billardi p.p.; Blanco, 1984: 45-46, pl. 42 figs 96-97 (part belongs to *O. shetlandica* Stepan'yants, 1979).

Polypiumaria antarctica; Billard, 1914: 28-31, fig. 17.

Material examined.— Antarctic Expeditions with R.V. Polarstern: ANT I-2 Stn 216, three fragments up to 34 mm high, with gonothecae (holotype: RMNH Coel. no. 27435, three slides no. 3219).— ANT I-2 Stn 220, four fragments of a c. 40 mm hydrocaulus, no gonothecae (RMNH Coel. no. 27436, two slides no. 3220).— ANT V-4 Stn 672, fragment of axis c. 7 mm long (RMNH Coel. no. 27437, slide no. 3221).— ANT VII-4 Stn 224, single 105 mm high stem, no gonothecae (RMNH Coel. no. 27438, two slides no. 3222).— ANT VII-4 Stn 230, single hydrocaulus 65 mm high; no gonothecae (RMNH Coel. no. 27439, slide no. 3223).— ANT VII-4 Stn 250, single hydrocaulus 95 mm high; no gonothecae (RMNH Coel. no. 27440, slide no. 3224).— ANT VII-4 Stn 259, two stems 68 and 90 mm high; no gonothecae (RMNH Coel. 27441, two slides no. 3225).— ANT VII-4 Stn 269, single stem 85 mm high; no gonothecae (RMNH Coel. no. 27442, slide no. 3226).— ANT VII-4 Stn 271, two hydrocauli c. 88 mm high and several fragments up to 80 mm high (RMNH Coel. no. 27443, two slides no. 3227; MNHN Hy no. 1176).— ANT VII-4 Stn 273, four fragments up to 39 mm high; no gonothecae (RMNH Coel. no. 2744, slide no. 3228; MNHN Hy no. 1177).— ANT VIII-5 Stn 16-396, three stems 90, 98 and 170 mm high; no gonothecae (RMNH Coel. no. 27445, three slides no. 3229).— ANT VIII-5 Stn 16-399, single 60 mm high stem, no gonothecae (RMNH Coel. no. 27446, slide no. 3230).— ANT VIII-5 Stn 16-407, single 160 mm high

stem; no gonothecae (RMNH Coel. no. 27447, slide no. 3231).— ANT VIII-5 Stn 16-423, several stems and fragments up to 70 mm high (RMNH Coel. no. 27448, 2 slides no. 3232; NHM no. 1995.1726).— ANT VIII-5 Stn 16-468, two stems 170 mm and 130 mm high; no gonothecae (RMNH Coel. no. 27449, two slides no. 3233; NHM no. 1995.1727).— ANT VIII-5 Stn 16-496, single stem 80 mm high; no gonothecae (RMNH Coel. no. 27450, slide no. 3234).— ANT IX-3 Stn 129, Several fragments up to 110 mm long, probably originating from two colonies; no gonothecae (RMNH Coel. no. 27451, two slides no. 3235).— ANT IX-3 Stn 174, two fragmented stems 165 and 195 mm high; no gonothecae (RMNH Coel. no. 27452, slide no. 3236) (for exact locality references see Peña Cantero et al., 1997).

Diagnosis.— Colonies with partly polysiphonic, unbranched stem. Hydrocauli undivided; nodes only occasionally present. Stem with apophyses alternately arranged in two longitudinal series; angle between apophyses and stem 70–80°. Cauline apophyses giving rise to hydrocladia and provided with two axillary nematophores, emerging through simple perisarc holes; without node between apophyses and hydrocladia. Hydrocladia up to fourth order present; hydrocladia of lower order arising from first internode of previous hydrocladium. Hydrocladia divided into hydrothecate internodes. Unforked hydrocladial internodes with one hydrotheca placed in middle of internode, one naked, mesial superior nematophore emerging through a perisarc hole behind free part of adcauline hydrothecal wall, and one mesial inferior nematophore provided with a scale-shaped nematotheca. Adcauline hydrothecal wall with small free portion. Abcauline hydrothecal wall convex, much longer than adcauline wall; consequently, kidney-shaped hydrothecal aperture facing internode. Forked hydrocladial internodes with one hydrotheca at axil of bifurcation and three nematophores: two naked nematophores, one on each prong of bifurcation and placed behind free part of adcauline wall, and one mesial inferior nematophore provided with scale-shaped nematotheca. [see Peña Cantero et al. (1997) for a complete description and figures of this species under the name *O. billardi*].

Remarks.— As stated above, the material identified as *Oswaldella billardi* by Peña Cantero et al. (1997) actually belongs to another species, *Oswaldella erratum* spec. nov. We now consider the material described by those authors from ANT I-2 Stn 216, provided with gonothecae, as the holotype of *O. erratum* spec. nov., the remaining material as the paratypes.

Oswaldella erratum spec. nov. and *O. billardi* share a few characteristics as the presence of an infrathecal, scale-shaped nematotheca on the hydrocladial internodes, the presence of two naked axillary nematophores on the cauline apophyses, the high hydrotheca with convex abcauline wall, and the unbranched stems. However, there are also differences: the stem in *O. erratum* spec. nov. is partly polysiphonic and is not divided into internodes, whereas that of *O. billardi* is monosiphonic and is divided into internodes; the angle between cauline apophyses and stem is c. 45° in *O. billardi*, whereas it is 70–80° in *O. erratum* spec. nov.; there is a distinct node between cauline apophyses and hydrocladia in *O. billardi* which is absent in *O. erratum* spec. nov.; there are secondary hydrocladia in *O. billardi* whereas hydrocladia up to the fourth order are present in *O. erratum* spec. nov.; the perisarc is much more strongly developed in *O. erratum* spec. nov. whereas the hydrotheca is longer in *O. billardi*; the adcauline hydrothecal wall is for c. $\frac{1}{3}$ of its length free in *O. billardi*, whereas the free portion is inconspicuous in *O. erratum* spec. nov.; the hydrotheca is placed on the distal half of the hydrocladial internode in *O. billardi*, whereas it is situated in the middle of the internode in *O. erratum* spec. nov.; finally, the shape of the gonotheca is different.

Broch (1948) assigned to *O. billardi* material that clearly belongs to *O. erratum* spec. nov. as the colonies are stiff due to the thick perisarc, there are hydrocladia up to the third order, the division into internodes is frequently indistinct ("faded away" in Broch's terminology), the hydrotheca is placed in the middle of the internode and the free portion of its adcauline wall is short.

Stepan'yants (1979) described as *Oswaldella billardi shetlandica* material which Peña Cantero et al. (1995) later on demonstrated to be composed of two species, namely *O. shetlandica* Stepan'yants, 1979, and another species, that they considered to be conspecific with *O. billardi* and that, as they remarked, was similar to the "Polarstern" material. Now, after re-examining the type material of *O. billardi*, is clear that both Stepan'yants' and the "Polarstern" material belong to *O. erratum* spec. nov.

The material from Petermann Island assigned to *O. billardi* by Blanco (1984) also has features of *O. erratum* spec. nov., since the colonies are stiff with thick perisarc, the hydrothecal aperture is kidney-shaped and the free part of the adcauline hydrothecal wall is small. The material from Low Island also assigned to *O. billardi* by Blanco (1984) belongs to *O. shetlandica*, as was already stated by Peña Cantero et al. (1995).

Billard (1914) tentatively identified as *Oswaldella antarctica* (Jäderholm, 1904) material that Briggs (1938) considered conspecific with the species he described as *O. billardi*. However, we believe Billard's material to be conspecific with *O. erratum* spec. nov. because the single 7 cm high colony found by Billard is slightly polysiphonic basally, the stem is not divided into internodes, there are hydrocladia up to the third order, the perisarc is strongly developed and the free portion of the adcauline hydrothecal wall is short.

Oswaldella erratum spec. nov. differs considerably from the remaining species of the genus. In hydrothecal shape it is allied to *O. shetlandica* Stepan'yants, 1979, but in the latter there is no infrathecal, scale-shaped nematotheca, the stem is divided into internodes and there are, besides the two axillary nematophores, two nematophores emerging through "mamelons" on the cauline apophyses.

By the presence of two axillary nematophores emerging through perisarc holes in the cauline apophyses, the high hydrotheca and the absence of a node separating cauline apophyses and hydrocladia *Oswaldella erratum* spec. nov. is allied to *O. incognita* Peña Cantero, Svoboda & Vervoort, 1997 and *O. rigida* Peña Cantero, Svoboda & Vervoort, 1997. Nevertheless, there are distinct differences. Thus, *O. incognita* differs by the monosiphonic and divided stem, the presence of hydrocladia up to the second order, the angle between cauline apophyses and stem (c. 45°) and the hydrothecal shape, the rim of the hydrothecal aperture being even. *Oswaldella rigida*, although it also shares with *O. erratum* spec. nov. the angle formed by the cauline apophyses and the stem, mainly differs by the monosiphonic and branched stem, usually divided into internodes, and by the shape of the hydrotheca; the rim of the hydrothecal aperture has an adcauline elevation.

Ecology and distribution.—*Oswaldella erratum* spec. nov. is a shelf species having been found from 70 m (Billard, 1914) to 696 m depth (Peña Cantero et al., 1997) on bottoms composed of mud and sand (Broch, 1948), mud and pebbles (Billard, 1914) and on rocky and stony bottoms (Peña Cantero et al., 1997). Fertile colonies were found in November (Billard, 1914) and in March (Peña Cantero et al., 1997).

Oswaldella erratum spec. nov. seems to be endemic in West Antarctica. It has been reported from 64°49.55'S 65°45.18'W, in Port Lockroy, Roosen Channel (Billard, 1914);

off Bouvet and Peter I Islands (Broch, 1948), off the South Orkney Islands (Stepan'yants, 1979); off Petermann Island (65°10'S 64°10'W) (Blanco, 1984) and off the east coast of the Weddell Sea (Peña Cantero et al., 1997).

Etymology.— The specific name *erratum* has been derived from the latin "erratum", meaning mistake and refers to the fact that this species was at first erroneously assigned to another species.

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