

## Scientific Note

### Species records, mistaken identifications, and their further use: the case of the diskfish *Echeneis naucrates* on a spinner dolphin

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The single record of the sharksucker (*Echeneis naucrates*) attached to a spinner dolphin (*Stenella longirostris*) is based on a photograph taken at Fernando de Noronha Archipelago, off northeast Brazil. A careful examination of this photograph demonstrates that the diskfish attached to the dolphin is the whalesucker (*Remora australis*), a species so far recorded on cetaceans only. Thus, the record of *S. longirostris* as a host for *E. naucrates* is here invalidated and the value of vouched records is reiterated. The exaggerated reliance even on refereed papers dealing with species records and checklists that lack or have dubious vouchers and their further use is commented upon.

O único registro da rêmora *Echeneis naucrates* sobre golfinho-rotador (*Stenella longirostris*) é baseado numa fotografia tirada em Fernando de Noronha, ao largo da costa nordeste do Brasil. Um exame cuidadoso desta fotografia demonstra que a rêmora fixada no golfinho é um indivíduo de *Remora australis*, uma espécie registrada somente em cetáceos. Portanto, o registro de *E. naucrates* sobre *S. longirostris* é aqui invalidado e o valor de registros atestados por comprovantes é reiterado. A confiança exagerada, mesmo em publicações arbitradas, em registros de espécies e listas faunísticas sem comprovantes ou com comprovantes dúbios e o seu uso posterior são aqui comentados.

**Key words:** Remora-dolphin associations, Mistaken species record, Use of vouchers, Refereed papers.

Remoras or diskfishes (Echeneidae) are characterized by a sucking disk on the top of the head – in most species the disk extends to the anterior part of the dorsum – that allows them to attach to several host types and even floating objects to “hitch-hike” (review in O’Toole, 2002). Echeneidae contains eight recognized species (O’Toole, 2002), of which *Echeneis naucrates* is the most versatile (O’Toole, 2002; Sazima & Grossman, 2006) fastening to a wide variety of hosts, including conspecifics (Brunschweiler & Sazima, 2006) and cetaceans (Fertl & Landry, 1999a; Fertl *et al.*, 2002; Noke, 2004; Santos & Sazima, 2005).

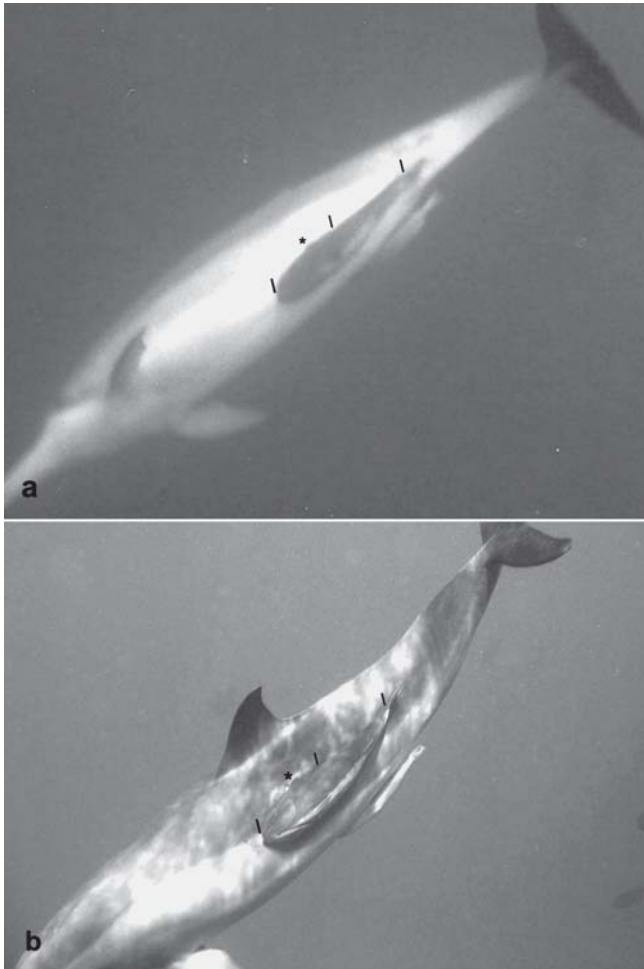
There is a single record of a sharksucker (*E. naucrates*) attached to a spinner dolphin (*Stenella longirostris*), based on a personal communication by a Brazilian cetologist and vouched by a photograph (Fertl & Landry, 1999a, b; L. Lodi, pers. comm.). However, in both publications that mention this record, the photograph is not presented, and thus the record could not be verified. In a recent study on the dynamics of spinning behavior of the spinner dolphin, this single record backed an ancillary issue, *viz.*, one possible effect of spinning on attached remoras (Fish *et al.*, 2006).

A careful examination of the photograph upon which the single record is based on (Fertl & Landry, 1999a, b) demonstrates a case of mistaken identification, as the fish attached to the dolphin does not match the characteristics of *E. naucrates*. The issue is here examined and the reliance on papers with no or dubious vouchers is commented upon.

The voucher photograph of the alleged sharksucker (*E. naucrates*) attached to a spinner dolphin was obtained as a digital file from Liliane Lodi, the Brazilian cetologist who forwarded a copy to Dagmar Fertl (see Fertl & Landry, 1999a, b). The file was scrutinized for diagnostic features and checked against digital or digitalized photographs and drawings of all presently recognized remora species (*e.g.* Follett & Dempster, 1960; Rice & Caldwell, 1961; Lachner, 1966; Robins & Ray, 1986; Humann, 1996; Williams *et al.*, 2004; Froese & Pauly, 2006; Silva-Jr. & Sazima, 2006). Contact was made with Liliane Lodi and Dagmar Fertl, who informed about the authenticity of the photograph (Lodi); its use in the reports (Lodi – according to Fertl a xerox copy and an identification by a Brazilian ichthyologist were used to back the two reports); site where it was taken

(Lodi); approximate dates (Lodi, Fertl); name of the ichthyologist who identified the remora (Fertl). The ichthyologist was contacted as well, but he did not remember the case. Voucher digital or digitalized photos (including the original used for the record of *E. naucrates* on spinner dolphin) used for the analyses are on file at the Museu de História Natural da Universidade Estadual de Campinas (ZUEC).

The voucher upon which the record of *Echeneis naucrates* on a spinner dolphin is based on shows the diagnostic features of the whalesucker (*Remora australis*), even if the pho-



**Fig. 1** Detail of the photograph upon which the single and mistaken record of the sharksucker (*Echeneis naucrates*) on a spinner dolphin (*Stenella longirostris*) is based on (a); note bicolored pattern – dark and light halves of the fish’s ventral side. Photo taken in the Baía dos Golfinhos at Fernando de Noronha, courtesy L. Lodi. Whalesuckers (*Remora australis*) attached to a spinner dolphin (b); note similarity between shape, proportions, and pattern of the larger foremost remora on both dolphins. Photo taken in the Baía dos Golfinhos at Fernando de Noronha, courtesy J. M. Silva Jr. Bars mark sucking disk and standard lengths; asterisks mark anterior edge of pectoral fin (originally marked on magnified digital photographs). For both pictures the original colors were discarded, since black and white images enhance the diagnostic features in print and allow a better comparison.

tograph is somewhat poor (Fig. 1a). A comparison with a better photograph of *R. australis* attached to a spinner dolphin in a similar position (Fig. 1b) leaves no doubt about the identity of the remora species shown in the above mentioned voucher. Both photographs show remoras with similar if not the same shape, proportions, and pattern – additionally, both photos were taken at the same site (Baía dos Golfinhos at Fernando de Noronha, an oceanic archipelago off northeast Brazil).

The remora individual used to support the above mentioned record has a bicolor pattern as seen from its ventral side (Fig. 1a), a feature sometimes displayed by the variable-colored *R. australis* (Figs. 1b, 2). On the other hand, *E. naucrates* has a tricolor pattern (Fig. 3), even if some large individuals have the blackish lateral stripe faded or present on the head only.



**Fig. 2** Whalesuckers (*Remora australis*) attached to a spinner dolphin showing relative size of sucking disk, body shape, and two color patterns. Bars mark sucking disk and standard lengths. Photo taken in the Baía dos Golfinhos at Fernando de Noronha, courtesy J. M. Silva Jr.



**Fig. 3** Sharksucker (*Echeneis naucrates*) resting on a reef, showing relative size of sucking disk, body shape, proportions, and color pattern. Bars mark sucking disk and standard lengths. Photo taken at Fernando de Noronha, courtesy D. Brisolla.

The mistaken identification of the diskfish in the single record of *E. naucrates* on a spinner dolphin (Fertl & Landry, 1999a, b) is likely due to a series of factors. Perhaps the most important one is the poor quality of the photograph even if the diagnostic features of the whalesucker (*R. australis*) are visible on it. Another factor might be the insufficient knowledge of this latter species in Brazilian waters at the time of the identification (late nineties – D. Fertl, L. Lodi, pers. comm.). Only recently studies on the relationship between remoras and dolphins became available for this area of the Western Atlantic (Sazima *et al.*, 2003, Silva-Jr. *et al.*, 2005; Santos & Sazima, 2005; Silva-Jr. & Sazima, 2006). Finally, the most visible individual on the dolphin displays a bicolor pattern, a feature not often seen in *R. australis*. This latter factor could have led the ichthyologist and the authors of the record to mistake the photographed individual for *E. naucrates*, a species with a tricolor pattern (*e.g.* Robins & Ray, 1986; Humann, 1996; Williams *et al.*, 2004; Noke, 2004; Froese & Pauly, 2006; Sazima & Grossman, 2006). However, in some large individuals of this latter species the dark lateral stripe tends to fade off (*e.g.* Humann, 1996; Brunschweiler & Sazima, 2006), which conveys an impression of a uniformly colored fish.

Based on the evidences presented above, the single alleged record of *E. naucrates* on a spinner dolphin (Fertl & Landry, 1999a, b) is here invalidated. The attachment of *E. naucrates* on *Stenella longirostris* seems remote, given the inshore habits of this remora species (Randall, 1996; Sazima & Grossman, 2006) and the pelagic habitat of the spinner dolphin (Norris *et al.*, 1994; Perrin, 2002). Presently *E. naucrates* is reported on two non-spinning cetacean species only, the bottlenose dolphin *Tursiops truncatus* on the Atlantic coast of United States (Fertl & Landry, 1999a, b; Fertl *et al.*, 2002; Noke, 2004) and the tucuxi dolphin (*Sotalia guianensis*) on the southern coast of Brazil (Santos & Sazima, 2005), all records in coastal waters.

The problems associated with a correct identification of a remora species on a remote and free-swimming host are aptly pointed out by Fertl & Landry (1999a, b, 2002), who express their concern about identity assignment to any remora under this circumstance. This concern notwithstanding, the mistaken record of the sharksucker on a spinner dolphin made its way to a study of dolphin spinning behavior, backing the issue of the effect of spinning to hydrodynamically dislodge and shear off an attached remora (Fish *et al.*, 2006). Although the use of *E. naucrates* in the calculations has a direct influence on the figures presented by Fish *et al.* (2006), the validity of the mathematical model of remora removal remains unaffected, since it is not dependent on the species, but on physical parameters (D. Weihs, pers. comm.). However, the biological significance of the model is open to interpretation, as any other scientific hypothesis, and it would be enlightening to know which figures would be obtained with use of the remora intimately associated with spinner dolphins, the whalesucker *R. australis* (*e.g.* Silva-Jr. *et al.*, 2005; Silva-Jr. & Sazima, 2006). This latter is a stockier species, reaches about half the size of *E. naucrates*, and has a sucking disk about

twice as large (*e.g.* Follett & Dempster, 1960; Rice & Caldwell, 1961; Robins & Ray, 1986; Humann, 1996; Noke, 2004; Froese & Pauly, 2006; Silva-Jr. & Sazima, 2006). Unfortunately, the physical parameters needed for such calculations are presently unavailable for *R. australis* (D. Weihs, pers. comm.).

Authors should use sound judgment when publishing species records or checklists, and should take care to back their studies with vouchers – be these actual specimens or photographs showing diagnostic features. In fact, this care should be exercised by any biologist that publishes on one or more organisms. Vouchers, as their name imply, allow a re-examination of the organisms dealt with in a particular paper and, most importantly, they are crucial to clear misidentifications for further reference. It may be simple to publish species records and checklists, but it takes several and sometimes difficult or lengthy steps to clear the literature from misidentifications. For those records for which there are no vouchers, such a correction often proves impossible. On the other hand, authors should not have an exaggerated reliance even on refereed papers dealing with species records that lack or have dubious vouchers, and particular caution should be taken when using checklists. After all, referees are not supposed to specialize in every taxonomic group dealt with in a paper. Use of, and reliance upon, vouchers is obvious to a trained systematist, but this may sound alien to a researcher working on fishery biology, ecology, ethology, or physiology, to mention only a few areas of biological research.

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