

First record of the exotic *Poecilia latipinna* (Lesueur, 1821) from the Anzali Lagoon in the southern Caspian Sea basin, Iran

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Abstract. The present report confirms the presence and probable establishment of the exotic sailfin molly (*Poecilia latipinna*) from the southern Caspian Sea basin, Iran. The fish seems probably introduced to the Anzali Lagoon in Guilan Province due to the ornamental aquarium trade. This is the first documented record of sailfin molly from the basin, which shows the range extension of the fish in Iran.

Key Words: Anzali lagoon, aquarium, Caspian Sea basin, exotic fish, livebearer.

Introduction. The introduction of nonnative fish species has increased considerably within recent decades in Iran (Jouladeh-Roudbar et al 2015; Mousavi-Sabet 2018), reaching 29 confirmed species (about 9.76% of its ichthyofauna) belonging to eleven families (Esmaeili et al 2018). Introductions of fish species into Iranian water bodies date back a long time, but were most prominent in the 1920s, when the mosquitofish, *Gambusia holbrooki* (Poeciliidae) was introduced as an anti-malarial agent (Esmaeili et al 2010; Jouladeh-Roudbar et al 2015). Since then, six freshwater ornamental fish species have been reported within the last few years in Iran: goldfish, *Carassius auratus* (Linnaeus, 1758), piranha, *Piaractus brachypomus* (Cuvier, 1818) (Esmaeili et al 2017), convict cichlid, *Amatitlania nigrofasciata* (Günther, 1867) (Mousavi-Sabet & Eagderi 2016; Esmaeili et al 2017), sailfin molly *Poecilia latipinna* (Lesueur, 1821) (Esmaeili et al 2017; Mousavi-Sabet 2018), guppy, *Poecilia reticulata* Peters, 1859 (Mousavi-Sabet & Eagderi 2014), and swordtail, *Xiphophorus hellerii* Heckel, 1848 (Esmaeili et al 2017). Therefore, aquarium trade has been regarded as one of the important pathways for the introduction of non-indigenous species in the country. In addition to the ornamental fish trade, aquaculture, sport fishing, control of malaria, research and accidents have been the main reasons for these introductions (Jouladeh-Roudbar et al 2015; Radkhah et al 2016).

Livebearers are popular ornamental fishes in Iran, also important as research models, which are recently studied in terms of ontogeny, growth, sex reversal, etc. (Mousavi-Sabet & Ghasemnezhad 2013; Faghani-Langroudi et al 2014; Mousavi-Sabet et al 2013, 2014, 2015; Moshayedi et al 2015a, Moshayedi et al 2015b, Khiabani et al 2016). The family Poeciliidae (37 genera and about 304 species) includes live-bearing fishes of small sizes (<200 mm length), having diverse morphology and coloration, with distributions in the freshwater and brackish environments of the eastern United States, South America, and Africa, including Madagascar (Moyle 2002; Nelson 2006). The genus *Poecilia* is native to the Americas, and some species in the genus are euryhaline (Nelson 2006). One of the most important species in livebearer ornamental fish culture is the sailfin molly (*Poecilia latipinna*), which is one of the most popular freshwater aquarium

fish species (Mousavi-Sabet et al 2015; Moshayedi et al 2015a). This exotic fish was observed for the first time in the Anzali Lagoon, in the southern Caspian Sea basin, north of Iran.

Material and Method. The *P. latipinna* specimens were collected by hand-net during fieldwork in the Anzali Lagoon, the Caspian Sea basin (37°27'53.91"N, 49°20'26.23"E) (Figure 1), Guilan Province, north of Iran, on 10 April 2021 (Figure 2). The specimens were preserved in 10% formalin after anesthetizing with 1% clove solution and transferred to laboratory for further processing. Another exotic poeciliid, *Gambusia holbrooki*, was also collected during the sampling.

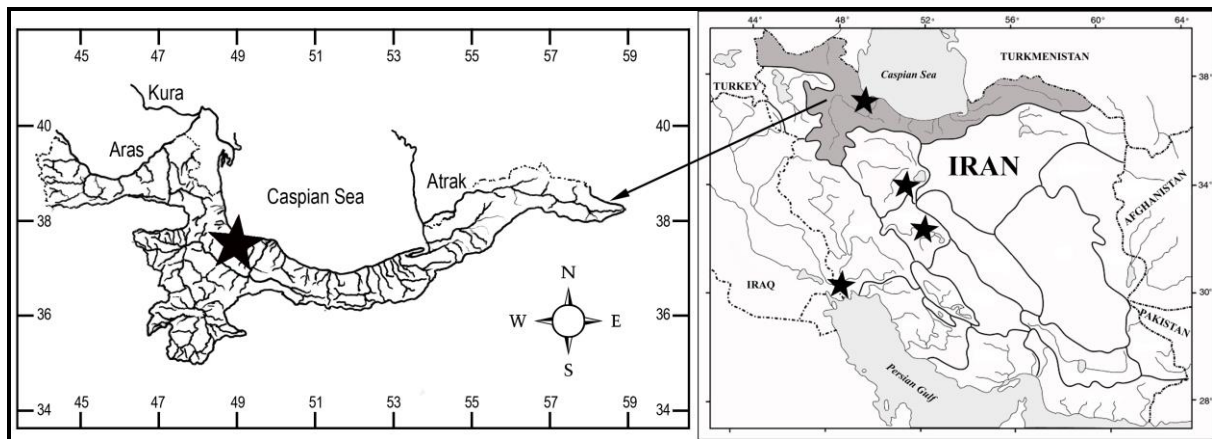


Figure 1. Map of the Iranian water basins (right); showing the documented distribution of the exotic *Poecilia latipinna* in Esfahan, Namak and the Tigris River basins; and the southern Caspian Sea basin (left), the new habitat where the fish were introduced in the Anzali Lagoon.

Results and Discussion. A total of 7 individuals (5 females and 2 males) of *P. latipinna* (58-64 mm SL, 2.2-4.9 g) were collected from the Anzali lagoon. The collected *P. latipinna* specimens (Figure 3) were identified by the number of scales in the caudal peduncle, which is a useful character definitely identifying individuals as *P. latipinna* (Koutsikos et al 2017). Like other poeciliids, sexual dimorphism is clear in adult specimens, as males have a developed gonopodium, which is a specialized reproductive fin found only in male fish (Mousavi-Sabet et al 2012; Mousavi-Sabet 2018).



Figure 2. The Anzali Lagoon, the southern Caspian Sea basin, Iran; catching site of *Poecilia latipinna*.



Figure 3. *Poecilia latipinna*: above - male, below - female; Iran, the southern Caspian Sea basin, the Anzali Lagoon.

The sailfin molly was introduced into Iran as an aquarium fish, but it is now established in natural habitats e.g., in the Caspian Sea (the present record), Tigris, Namak and Esfahan basins.

This species is native to the southeastern U.S.A. and south to Mexico, but because of its wide environmental tolerance (Nunes et al 2015) and popularity as an aquarium fish, *P. latipinna* has been introduced widely (Al-Faisal & Abdullah 2014) and has established breeding populations in most countries. Several countries have reported adverse ecological impacts of *P. latipinna* after its introduction (Smith 1997). *P. latipinna*, like other introduced species, may cause harm to native fishes because of its ability to reproduce rapidly. As the introduction of exotic fishes may affect populations of native fishes through predation, competition, habitat changes, genetic changes, and introduction of parasites and diseases, special care should be taken to prevent such introductions. Therefore, this species may have a negative impact on native fish populations through competition, habitat changes, and introduction of parasites and diseases (Esmaeili et al 2010, 2014, 2017).

The first evidence of the sailfin molly, *P. latipinna* introduction in natural water bodies of Iran comes from Khalaji et al (2016), who collected the fish from Hasan-Abad Qanat and Malvajerd, in Esfahan Province, Zayandehrud (or Esfahan) Basin. Khalaji et al (2016) also reported two ectoparasites from the collected specimens. Esmaeili et al (2017) reported another established population of *P. latipinna* in the Tigris River tributary in Iran. Afterwards, Mousavi-Sabet (2018) recorded the species for the first time in Namak Lake basin in central Iran. And now, the present study has documented the first occurrence of the sailfin molly in the Anzali Lagoon. It is also the first record for the southern Caspian Sea basin, which shows the range extension of the fish in the country.

Conclusions. The first occurrence of the sailfin molly in the Anzali Lagoon, the Caspian Sea basin, north of Iran, was documented. Eradication programs can be successful in the case of *P. latipinna* in the Caspian Sea basin, based on the restricted distribution. However, such programs have to be accompanied by a public awareness campaign to

ensure that the aquarium trade and hobbyists do not release these pet fishes into natural habitats. Monitoring of this fish is highly recommended.

Acknowledgements. We would like to thank Hojat Emamdoust for helping with the fish collection in the Anzali Lagoon and the University of Guilan for financial support.

Conflict of Interest. The authors declare that there is no conflict of interest.

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Received: 10 April 2021. Accepted: 15 May 2021. Published online: 20 May 2021.

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How to cite this article:

Mousavi-Sabet H., Sarpanah A., Avani A., 2021 First record of the exotic *Poecilia latipinna* (Lesueur, 1821) from the Anzali Lagoon in the southern Caspian Sea basin, Iran. *Poec Res* 11(1):1-5.