First record of the convict cichlid, *Amatitlania nigrofasciata* (Günther, 1867) (Teleostei: Cichlidae) from the Namak Lake basin, Iran

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Abstract: The convict cichlid, *Amatitlania nigrofasciata* (Günther, 1867) is recorded for the first time from Soleymaniyeh spring, Namak Lake basin in central Iran, the second record of this species from the country. *Amatitlania nigrofasciata* has been probably released into the spring, as an aquarium fish by local people, but has been now possibly established in this water body. The monitoring of this exotic fish is highly recommended.

Keywords: Soleymaniyeh Spring, Aquarium, Exotic fish, Monitoring.

Introduction

Similar to trends observed in other countries, the number of non-native fish species introduced in Iran has increased considerably over recent decades reaching twenty-seven confirmed species in 9 families (Jouladeh-Roudbar et al. 2015). Introductions of fish species into Iranian water bodies dates 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. 2010a). Among the exotic fish species of Iran, the family Cyprinidae with 11 species (40.74% of exotic species) is ranked first followed by Salmonidae (5 species, 18.52%), Poeciliidae with 3 species (11.11%), Mugilidae and Cichlidae both with 2 species (7.41% each) and 3 families each with only one species (3.70% each) (Jouladeh-Roudbar et al. 2015). Aquaculture, sport fishing, control of malaria, research and accidental introductions have been the main reasons for these introductions in Iran, and only three species have been established from ornamental sources: *Xiphophorus hellerii*, *Poecilia reticulata*, and *Amatitlania nigrofasciata* (Esmaeili et al. 2010b, 2013; Mousavi-Sabet & Eagderi, 2014).

*Amatitlania nigrofasciata* was formerly known as *Cichlasoma nigrofasciatum* (Günther, 1867) and *Archocentrus nigrofasciatus* (Günther, 1867) is an alien fish species which was reported from the Middle East about 20 years ago (see Esmaeili et al. 2013). It is native to the Pacific slope of Central America, found from Río Sucio, El Salvador, to Río Suchiate, Guatemala, and occurring on the Atlantic slope from Río Patuca, Honduras, to Río Jutiapa, Guatemala (Komar 2009; Matamoros et al. 2009; Ishikawa & Tachihara 2010). Since 1920, this species has been widely introduced, probably all via the ornamental fish trade (Lever 1996; Fuller et al. 1999; Roll et al. 2007; Baptiste et al. 2010; Cossíos 2010; Ishikawa & Tachihara 2010; Piazzini et al. 2010; Pino-Del-Carpio et al. 2010; Scoppettone et al. 2011; Fishbase 2015).

In Iran, *Amatitlania nigrofasciata* is recently reported from Kol River drainage, Hormuz basin, southern Iran (Esmaeili et al. 2013, 2014). Here we report this exotic fish for the first time from a small spring in the Namak Lake basin, central Iran.

Material and Methods

The *Amatitlania nigrofasciata* specimens were collected by electrofishing in two fieldworks during 2014-2015, in the Namak Lake basin, central Iran.
The habitat is Soleymaniyeh spring in Kashan City (33°56'44"N, 51°22'23"E 1041m), Isfahan Province, Iran. The specimens were preserved in 10% formaldehyde after anesthetizing with 1% clove extract solution and transferred to the laboratory for further studies. *Capoeta aculeata* (Valenciennes, 1844), *Poecilia reticulata* Peters, 1859 and *Xiphophorus hellerii* (Heckel, 1848) were also collected from the same locality during the sampling. All the six collected specimens of *A. nigrofasciata* were deposited in the collection of the Ichthyology Museum (GUIC), Department of Fisheries Sciences, Faculty of Natural Resources, University of Guilan, Guilan Province, Iran.

**Results and Discussion**

This is the first record of this non-native cichlid fish from a natural freshwater body of the Namak Lake basin, in central Iran (Soleymaniyeh spring), and the second record from the country. However, as the first record is related to the leucistic strain (Esmaeili et al. 2013), the new record is the only reported wild type of this species in Iran. Soleymaniyeh spring (Fig. 2) is a high water temperature (25°C) spring in Kashan City. Kashan City is the largest center of ornamental fish production in Iran with more than 1500 farms that produce more than 40% of ornamental fishes in Iran. In the Soleymaniyeh spring, there are traditional bridges and channels in the water flow, where are appropriate sites for hiding, nesting and breeding for *A. nigrofasciata* (Fig. 2c).

In total, six *A. nigrofasciata* specimens in different sizes (38-99.3mm), includes mature, immature and a spawning pair were collected. However, there were more small specimens, but they could escape as the fish is an active swimmer. The
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collected specimens characterized by 8-9 black vertical bars on a blue grey body, along with a dark blotch on the operculum (Fig. 3). Sexual dimorphism is clear in adult specimens as males are bigger than the females, also females marked by golden small blotches along flanks (Fig. 3).

According to Esmaeili et al. (2013), as part of Iranian tradition, people release wild creatures, particularly fish, into the wild during certain festivals (New Year ceremony). In the case of fish, many of them are released into freshwater habitats such as rivers, ponds and reservoirs and can thus result in the establishment of non-native fishes in new environments. Therefore, it seems *A. nigrofasciata* was introduced as an aquarium fish, but is now established in at least two natural habitats in Iran.

Although *A. nigrofasciata* from sampling station showed a restricted distribution and cannot be widely distributed but it might have negative impacts on native fish populations such as *C. aculeata* through competition, habitat changes, and introduction of parasites and diseases (Esmaeili et al. 2010b; 2014; Mousavi-Sabet & Eagderi 2014).

As conclusion, *Amatitlania nigrofasciata*, like other introduced species, may cause harm to native fishes as this is an aggressive and territorial species which is well-known for its ability to colonize rapidly and it also often carries alien parasites (Wisenden 1994; Bassleer 1997; Martinez et al. 2002). As Esmaeili et al. (2010b) and Mousavi-Sabet & Eagderi (2014) suggested for *X. hellerii* and *P. reticulata*, eradication programs can be successful in the case of *A. nigrofasciata*. There is a possible chance of success because of the yet very limited 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 ornamental fishes into the natural habitats.

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نخستین گزارش ماهی سیچلاید گورخری، Amatitlania nigrofasciata (Günther, 1867) برای نخستین بار از چشمه سلیمانیه حوضه دریاچه نمک در مرکز ایران و به عنوان دومین گزارش از ایران ثبت گردید. Amatitlania nigrofasciata احتمالاً به عنوان یک ماهی زینتی به وسیله مردم محلی به این جشنه معرفی شده است و اکنون احتمالاً در این منبع آبی جمعیت یابیداری را تشکیل داده است.

پایش این گونه غیربومی به شدت توصیه می‌گردد.

کلمات کلیدی: جشمه سلیمانیه، آکواریوم، ماهی غیربومی، پایش.