



Journal of Fish Biology (2010) **76**, 1529–1532

doi:10.1111/j.1095-8649.2010.02601.x, available online at www.interscience.wiley.com

First record of the black bullhead *Ameiurus melas* (Teleostei: Ictaluridae) in Poland

M. NOWAK*†, J. KOŠČO‡, W. POPEK* AND P. EPLER*

*Department of Ichthyobiology and Fisheries, University of Agriculture in Kraków, ul. Prof. T. Spiczakowa 6, 30-199 Kraków, Poland and ‡Department of Ecology, University of Prešov, 17. novembra 1, 081 16 Prešov, Slovakia

(Received 21 February 2008, Accepted 28 January 2010)

The North American catfish, the black bullhead *Ameiurus melas*, is recorded for the first time in Poland. The origin of these fish is not clear, but their presence may be associated with unregulated introductions by anglers.

© 2010 The Authors

Journal compilation © 2010 The Fisheries Society of the British Isles

Key words: distribution; Ictaluridae; non-native species; Vistula River drainage.

Species of the North American family Ictaluridae were introduced to Europe at the end of the 19th century for aquaculture, laboratory studies and aquaria (Wheeler, 1978; Welcomme, 1988). The species status of ictalurids was unknown to Wheeler (1978), when the occurrence of two species: *Ameiurus nebulosus* (LeSueur) and *Ameiurus melas* (Rafinesque), widespread in Europe, was determined (Wheeler, 1978). Furthermore, another three species: white catfish *Ameiurus catus* (L.), channel catfish *Ictalurus punctatus* (Rafinesque) and yellow bullhead *Ictalurus natalis* (LeSueur) were introduced into some countries (Raunich *et al.*, 1966; Wheeler, 1978; Welcomme, 1988; Koščo *et al.*, 2004; Britton & Davies, 2006; Kottelat & Freyhof, 2007). Germany was one of the first countries in Europe where ictalurids were imported from America (Horoszewicz, 1971; Wheeler, 1978; Kottelat & Freyhof, 2007). The part of the present territory of Poland, where ictalurids were introduced in 1885 (ponds in Barnówek near Szczecin), belonged to Germany in 1885, and it was probably here that the first introduction of ictalurids were made to polish waters (Horoszewicz, 1971). Identification of these fish has never been confirmed; however, all the relative publications from that time considered only *A. nebulosus* (Horoszewicz, 1971; Witkowski, 1996; Bryliński & Chybowski, 2000). In recent years, *A. melas* was recorded in several European countries: Slovakia (Koščo *et al.*, 2000), Portugal (Gante & Santos, 2002), Ukraine (Koščo, 2003), Serbia and Montenegro (Cvijanović *et al.*, 2005) and the Czech Republic (Hartvich & Lusk, 2006).

†Author to whom correspondence should be addressed: Tel: +48 12 6375176; fax: +48 12 6385979
email: mikhael.nowak@gmail.com

TABLE I. Diagnostic characters of the *Ameiurus melas* and *Ameiurus nebulosus* compared with data obtained from examined specimens ($n = 9$)

Character	<i>A. melas</i>	<i>A. nebulosus</i>	Examined specimens
Anal-fin base enlargement	Yes	No	Yes
Anal-fin membrane pigmentation	Black or dark	Lacking pigment	Black
Body coloration	Plain	Mottled	Plain
Anal-fin rays (total)	17–21	21–24	20 (21 in one specimen)
Caudal-fin rays	15–18	18–19	17
Dorsal-fin branched rays	5–6	6–7	6
Serrations on pectoral-fin spine	Poorly developed or absent; always absent near tip	Well-developed along full length, saw-like	Present, not very well-developed; absent near tip

In June and July 2007, nine ictalurids were caught by angling from marshes of the Kielecki Dam Reservoir (on the Silnica Creek, Vistula River drainage) in Kielce City (50° 53' N; 20° 37' E). All specimens were deposited in the Department of Ichthyobiology and Fisheries (University of Agriculture in Kraków, Poland; without numbers). Species identification was made following characters given in Table I (Hubbs & Lagler, 1947; Scott & Crossman, 1973; Harka, 1997; Wilhelm, 1998; Wilhelm *et al.*, 1999; Koščo *et al.*, 2000; Kottelat & Freyhof, 2007). All specimens examined were identified as *A. melas*.

It is not clear whether the presence of *A. melas* in Poland was a result of its natural dispersion from adjacent countries (*i.e.* Germany, Czech Republic, Slovakia or Ukraine), accidental co-introduction with import of fishes from abroad or intentional co-introduction with *A. nebulosus* at the end of the 19th century. Due to many mis-identifications of *A. melas* and *A. nebulosus* in the past, uncertainty of the literature data and obstacles in the identification of both species in the field, reconstruction of the origin and paths of distribution of *A. melas* in Poland (and in Europe in general) is very difficult (Kottelat & Freyhof, 2007). Irrespective of this, the occurrence of this species in the Kielecki Dam Reservoir tends to confirm the probability that illegal introductions by anglers present a real risk of unintentional introductions of non-native species and their subsequent dispersal. The reservoir was repaired from 2001 to 2003, when it was dry in summers and deep frozen in winters. Only a small stream Silnica Creek (21 km long and *c.* 1 m wide) flowed at the bottom of the reservoir. The ichthyo-biocenosis was formed by *Phoxinus phoxinus* (L.), *Gobio gobio* (L.), *Perca fluviatilis* L. and *Barbatula barbatula* (L.) during that time. The reservoir was not stocked after filling (in 2003), but some fishes were illegally introduced by anglers. Beside *A. melas*, the ichthyo-biocenosis is presently formed by *Carassius gibelio* (Bloch), *Cyprinus carpio* L., *G. gobio*, *Leucaspius delineatus* (Heckel), *P. phoxinus*, *Rhodeus amarus* (Bloch), *Rutilus rutilus* (L.), *Scardinius erythrophthalmus* (L.), *Tinca tinca* (L.), *P. fluviatilis* and *B. barbatula* (pers. obs.). Illegal introduction by anglers seems to be the most probable way of arrival of *A. melas* to the Kielecki Dam Reservoir. The origins of those ictalurids, however, is still not clear.

Ameiurus melas is a typical limnophilic and one of the most tolerant fish species capable of resisting water pollution (Ribeiro *et al.*, 2008). Due to their high fecundity and ecological plasticity, both *A. melas* and *A. nebulosus* are considered invasive species (Holčík 1991; Gante & Santos, 2002; Koščo *et al.*, 2004; Dextrase & Mandrak, 2006). Following the literature data, ictalurids are nocturnal zoophagophores, consuming all animals in the water column whose size allows the species to consume them. Besides invertebrates, among which insect larvae are preferred, ictalurids feed on molluscs and fishes, as well as algae, plant material and terrestrial invertebrates (Scott & Crossman, 1973; Bryliński & Chybowski, 2000; Kottelat & Freyhof, 2007; Leunda *et al.*, 2008). *Ameiurus* species are predators of small fishes and larvae that show identical microhabitat requirements (Leunda *et al.*, 2008). Moreover, they are vectors of alien parasites (Scholz & Cappellaro, 1993; Uzunova & Zlatanova, 2007). For those reasons, *A. nebulosus* is considered a pest in Poland, and fisheries legislation forbids release of this species into the wild. The ecological effects of *A. melas* seems potentially close to the *A. nebulosus*, so sustained monitoring of its distribution in the country and further studies on its origin in Poland are required.

The study was supported by Slovak Grant Agency VEGA, Project No. 1/0352/08 and APVV Project No. 0154-07.

References

- Britton, J. R. & Davies, G. D. (2006). First record of the white catfish *Ameiurus catus* in Great Britain. *Journal of Fish Biology* **69**, 1236–1238. doi: 10.1111/j.1095-8649.2006.01171.x
- Bryliński, E. & Chybowski, L. (2000). Sumik karłowaty *Ictalurus nebulosus* (Le Sueur, 1819). In *Ryby słodkowodne Polski* (Brylińska, M., ed.), pp. 354–356. Warszawa: PWN.
- Cvijanović, G., Lenhardt, M. & Hegediš, A. (2005). The first record of black bullhead *Ameiurus melas* (Pisces, Ictaluridae) in Serbian waters. *Archives of Biological Science (Belgrade)* **57**, 21–22.
- Dextrase, A. K. & Mandrak N. E. (2006). Impacts of alien invasive species on freshwater fauna at risk in Canada. *Biological Invasions* **8**, 13–14. doi: 10.1007/s10530-005-0232-2
- Gante, H. F. & Santos, C. D. (2002). First record of the North American catfish *Ameiurus melas* in Portugal. *Journal of Fish Biology* **61**, 1643–1646. doi: 10.1006/jfbi.2002.2166
- Harka, Á. (1997). Terjed vizeinkben a fekete törpeharcsa. *Halászat* **90**, 109–110.
- Hartvich, P. & Lusk, S. (2006). The first record of the black bullhead (*Ameiurus melas*) in the Třeboň district, Czech Republic. *Biodiversity of the Fishes of the Czech Republic VI*, 55–58.
- Holčík, J. (1991). Fish introductions in Europe with particular reference to its central and eastern part. *Canadian Journal of Fisheries and Aquatic Science* **48** (Suppl. 1), 13–23.
- Horoszewisz, L. (1971). *Sum*. Warszawa: PZWRiL.
- Hubbs, C. L. & Lagler, K. F. (1947). Fishes of the Great Lakes Region. *Bulletin of the Cranbrook Institute of Science* **26**, 1–186.
- Koščo, J. (2003). Príspevok k poznaniu ichtyofauny Hornej Tisy. *Natura Carpatica* **44**, 187–196.
- Koščo, J., Košuth, P., Harka, A. & Wilhelm, A. (2000). Ďalší nový druh ryby v našej ichtyofaune – sumček čierny (*Ameiurus melas* Rafinesque, 1820). *Pol'ovníctvo a rybárstvo* **52**, 33.
- Koščo, J., Košuth, P., Lusk, S. & Košuthová, L. (2004). Distribution of family Ictaluridae in the Slovakia and in the Czech Republic. *Biodiversity of the Fishes of the Czech Republic V*, 45–53.
- Kottelat, M. & Freyhof, J. (2007). *Handbook of European Freshwater Fishes*. Cornol: Kottelat and Freyhof.

- Leunda, P. M., Oscoz, J., Elvira, B., Agorreta, A., Perea, S. & Miranda, R. (2008). Feeding habits of the exotic black bullhead *Ameiurus melas* (Rafinesque) in the Iberian Peninsula: first evidence of direct predation on native fish species. *Journal of Fish Biology* **73**, 96–114. doi: 10.1111/j.1095-8649.2008.01908.x
- Raunich, L., Callegarani, C. & Cavicchioloi, G. (1966). Polimorfismo emoglobinico e caratteri sistematici del genere *Ictalurus* dell'Italia settentrionale. *Archivio Zoologica Italiana* **51**, 497–510.
- Ribeiro, F., Elvira, B., Collares-Pereira, M. J. & Moyle, P. B. (2008). Life-history traits of non-native fishes in Iberian watersheds across several invasion stages: a first approach. *Biological Invasions* **10**, 89–102. doi: 10.1007/s10530-007-9112-2
- Scholz, T. & Cappellaro, H. (1993). The first record of *Corallobothrium parafimbriatum* Befus et Freeman, 1973 (Cestoda: Proteocephalidea), a parasite of North American catfishes (*Ictalurus* spp.), in Europe. *Folia Parasitologica* **40**, 105–108.
- Scott, W. B. & Crossman, E. J. (1973). Freshwater fishes of Canada. *Bulletin of the Fisheries Research Board of Canada* **184**.
- Uzunova, E. & Zlatanova, S. (2007). A review of fish introductions in Bulgarian freshwaters. *Acta Ichthyologica et Piscatoria* **37**, 55–61.
- Welcomme, R. L. (1988). International introductions of inland aquatic species. *FAO Fisheries Technical Papers* **294**, 1–318.
- Wheeler, A. (1978). *Ictalurus melas* (Rafinesque, 1820) and *I. nebulosus* (LeSueur, 1819): the North American catfishes in Europe. *Journal of Fish Biology* **12**, 435–440. doi: 10.1111/j.1095-8649.1978.tb04186.x
- Wilhelm, A. (1998). Black bullhead (*Ictalurus melas* Rafinesque, 1820) (Pisces: Ostariophysi: Bagroidae), a new species of fish recently found in Romanian waters. *Travaux du Museum National d'Histoire Naturelle Grigore Antipa* **40**, 377–381.
- Wilhelm, S., Györe, K. & Sallai, Z. (1999). A Hármas-Körös fekete törpeharcsa (*Ictalurus melas* Raf. 1820) populációjának biometriai vizsgálata. *Halászat* **92**, 37–40.
- Witkowski, A. (1996). Introduced fish species in Poland: pros and cons. *Archives of Polish Fisheries* **4**, 101–112.