

# Parasites for Ponto-Caspian gobies (Actinopterygii: Gobiidae) in their native and non-native ranges

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During the last decades, seven Ponto-Caspian goby species: *Babka gymnotrachelus*, *Neogobius fluviatilis*, *N. melanostomus*, *Ponticola gorlap*, *P. kessleri*, *Proterorhinus semilunaris* and *P. semipellucidus*, have recently expanded their natural range, either by transoceanic translocation or along the three main European intracontinental invasion corridors (Fig. 1).

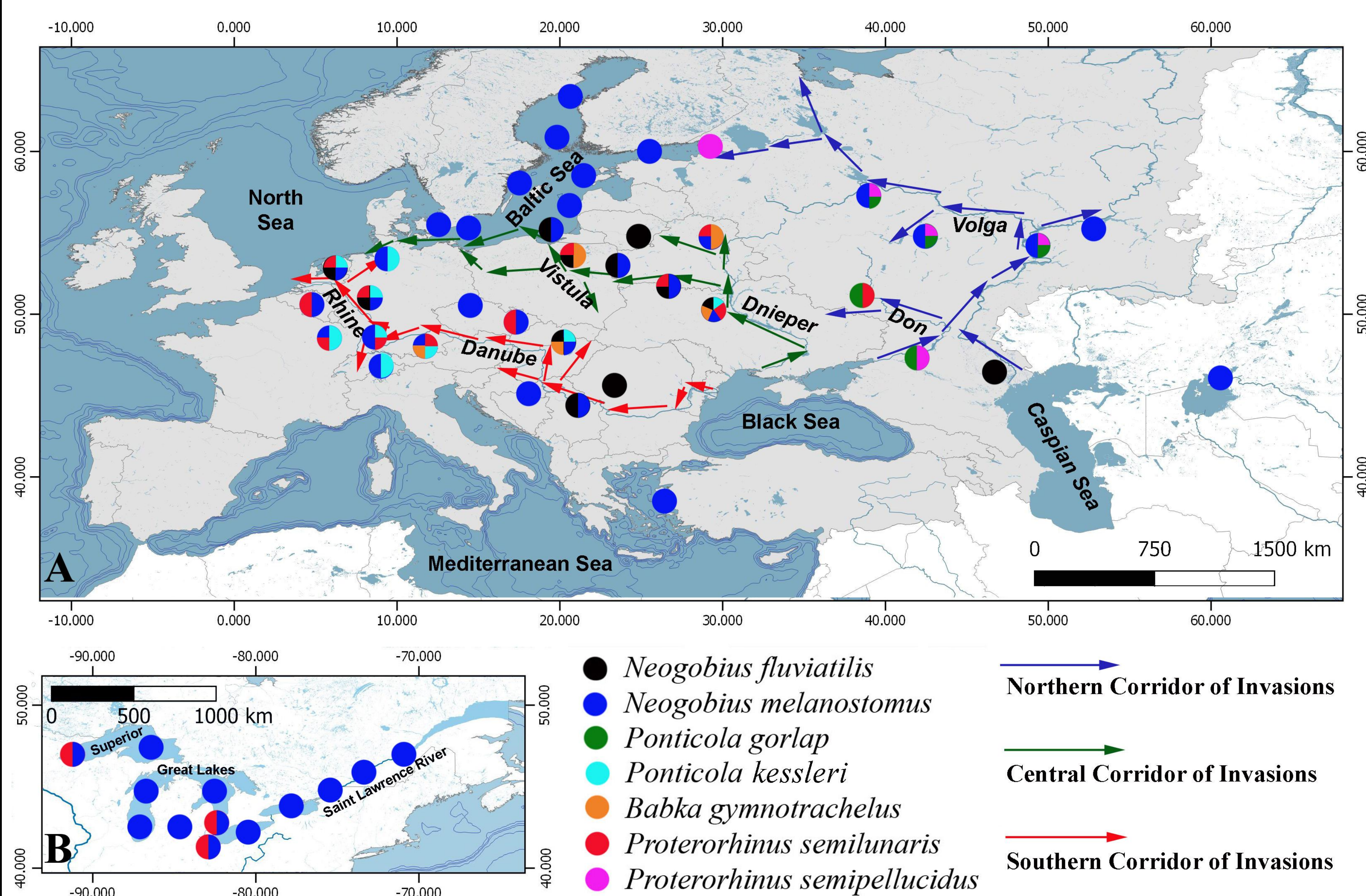


Fig. 1. Aquatic Invasion Corridors in Europe and the expansion of the Ponto-Caspian gobiids in (A) Old and (B) New Worlds.

## PARASITES

In their range of introduction, gobies have successively acquired a large number of local parasite species (Fig. 2). A total of 249 parasite taxa have been reported during 1931–2020, with 214 taxa from native and 151 from non-native ranges.

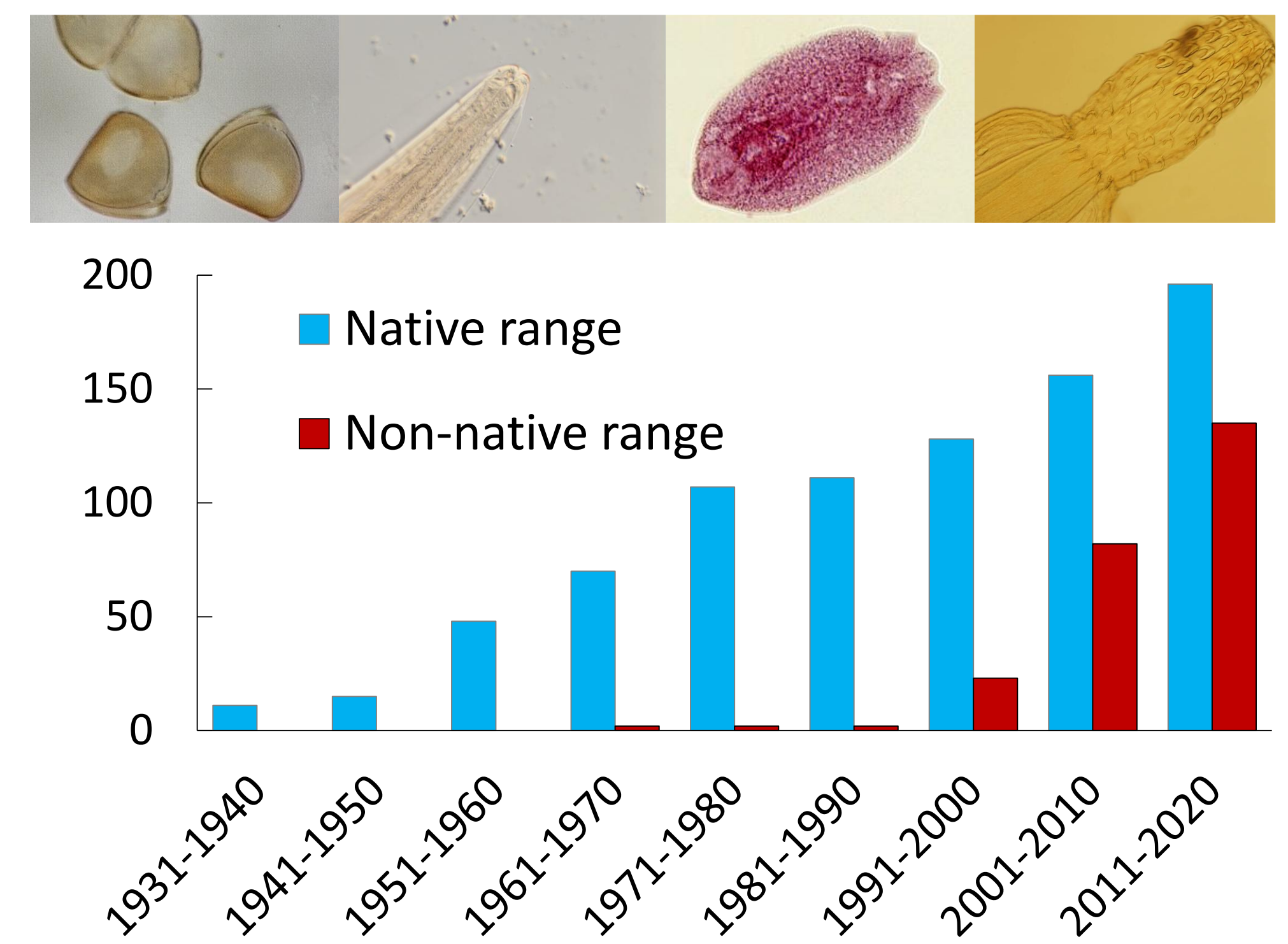


Fig. 2. Cumulative record of parasite species for Ponto-Caspian gobiid species in their native and non-native ranges, using data from 1931 to 2020.

## Parasite lost and acquisition along invasion corridors

- apparent reduction in native parasites in non-native ranges of all goby species
- parasite colonisation in non-native ranges differs between fish species and invasion corridors
- acquisition of high number of local parasite species indicates in non-native range
- competence of Ponto-Caspian gobies to a wide range of generalist parasites

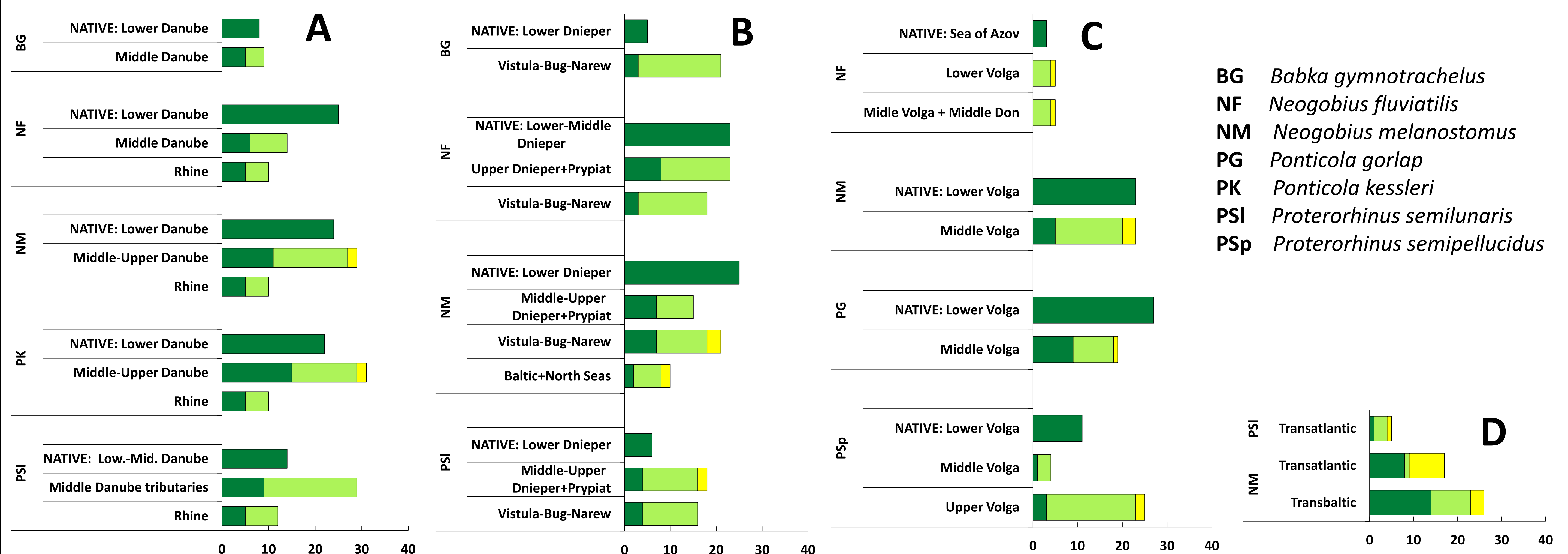


Fig. 3. Number of parasite species recorded in native and non-native regions in the (A) Southern, (B) Central and (C) Northern Invasion Corridors, also in relation to (D) Trans-Atlantic and Trans-Baltic Invasion. Dark green bars = parasites native to a particular goby species; light green bars = parasites acquired in non-native ranges, but native to the Ponto-Caspian region and never recorded in individual goby species; yellow bars = acquired parasites non-native to the Ponto-Caspian region.