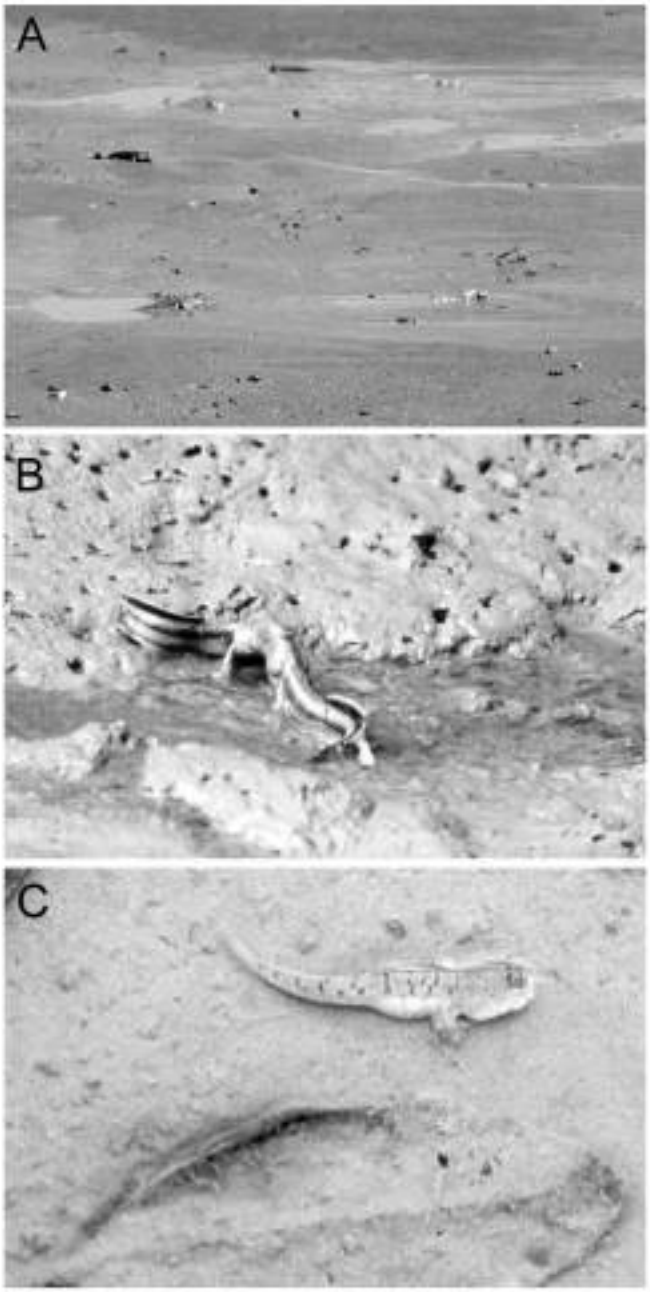

Fig. 3. *Boleophthalmus* species in their habitats. **A**, *B. caeruleomaculatus* on Derby coastal mudflat (Site N, July 2002); **B**, two *B. birdsongi* fighting on a sloping mudflat in Darwin Harbour (Site D, Nov. 2000); **C**, *B. birdsongi* juvenile in a pool in Middle Arm, Port Darwin (Site J, March 2003).

in size) in males than in females. The margins of these fins are white in both sexes, but become semi-transparent immediately after fixation.

Periophthalmus novaeguineaensis also shows sexual dichromatism (male Fig. 2J, female Fig. 2K): it has reddish dorsal fins, with the white colour of the DF1 and DF2 margins brighter in males (Fig. 2J). The species is easily recognisable in the field. The body colour becomes darker in males when mating (Fig. 8C). The anal fin is dark in larger males (Fig. 2J) and paler in females (Fig. 2K). *Periophthalmus takita* (Fig. 2L) differs from its congeners in having a large DF1 and two distinct horizontal dark stripes on the DF2. The anal fin and the ventral edge of the caudal fin are yellow in colour. All species of *Periophthalmus* usually show some oblique dark bars on the side of the body, though these markings are occasionally faint or indiscernible.

Scartelaos histophorus (Fig. 2M) is easily identified in the field on the basis of the body morphology and colouration (Table 3). The fish frequently erect the mast-like DF1. Males are larger than females.

Habitat conditions and lifestyle.

Boleophthalmus birdsongi and ***B. caeruleomaculatus***. The distribution of *B. birdsongi* was observed to be wider than that of *B. caeruleomaculatus* (Table 2). *Boleophthalmus birdsongi* occurred on every mudflat in the low intertidal zone in Darwin and Derby, inhabiting either sloping and rough (Fig. 3B) or level and smooth mudflats and muddy sandflats (see Table 2 for definition of topographical terms). *Boleophthalmus caeruleomaculatus* was restricted to mudflats that were always wet, smooth, comparatively level and more extensive than other mudflats studied (Fig. 3A, Table 2). Adults of both species of *Boleophthalmus* maintained a burrow for retreat when frightened or when the tide covered the habitat (Table 4). Deduced from the distinctive side to side movement of the head on exposed mudflats, both *B. birdsongi* and *B. caeruleomaculatus* likely foraged for surficial algae and diatoms, as known for all other congeners studied (Clayton 1993), during low tide within a territory around the burrow. Both species performed an aggressive display (Fig. 3B) when protecting the territory or chasing away approaching conspecifics. Courtship displays were observed in July (*B. caeruleomaculatus*) and August and November (*B. birdsongi*) (Table 4).

Habitat separation with growth was confirmed for *B. birdsongi* but not for *B. caeruleomaculatus.* Juveniles of *B. birdsongi* measuring from 22 to 66 mm TL (Figs 2B and 3C) were found in the intertidal zone close to the high water line of spring tide (HWS) during spring tide in March, July and November at Sites H and J; two sites where adult *B. birdsongi* were never observed. The juveniles of *B. birdsongi* disappeared from these high locations during neap tide when the habitat remained exposed by the tide and became dry. Unlike *B. birdsongi,* juvenile *B. caeruleomaculatus* of about 70 mm TL and smaller (Fig. 2D) occurred together with adults in March and July in the Howard River estuary (Fig. 1F; Site F) and on the Derby coast (Fig. 1N; Site N).

Periophthalmodon freycineti. Adults of *P. freycineti* (Fig. 4A) inhabited open mudflats as in site C but also occurred on stream banks in Sites B and E. Juveniles were found in March in small shallow pools in the sandy part of Site C (Fig. 4B) or on the forest floor of the Red Mangrove, *Rhizophora stylosa*, at Site B (Table 2); both areas of which were landward of the adult's habitat. This suggests that *P. freycineti* showed a clear habitat separation between different size classes (Table 2). Adults of *P. freycineti* were often found beside or near their burrows irrespective of