

## THE STATUS OF *GAMBUSIA AFFINIS* (BAIRD & GIRARD) IN SOUTH-WESTERN AUSTRALIA

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In a recently-published book on the native and introduced freshwater fishes of Australia (Lake 1971), no mention is made of the occurrence of *Gambusia affinis* (Baird & Girard) in Western Australia, although the wide distribution of this introduced pest in the Eastern States is acknowledged.

The truth is different, for actually *Gambusia* has been established in Western Australia for many years. Understandably, however, naturalists and zoologists are usually more interested in native fauna than in introduced exotic species and that is why in zoological literature little has been published on *Gambusia* in Western Australia. Whitley (1948) did not mention the species, but in the same year it was recorded from Lake Leschenaultia by Shipway (1948), who observed that in April 1948: 'No native fishes were found, the lake apparently containing only English Perch (*Perca fluviatilis*) and *Gambusia affinis*'. In later volumes of the *Western Australian Naturalist* I have traced four more references to *Gambusia affinis*, and perhaps it reflects the contempt in which this little fish is held that, although it has been recorded five times in five different volumes, its name is found in the index of only two. In chronological sequence the records are: Hyde Park Lake, Perth, where: 'An exotic fish, *Gambusia affinis*, has been introduced and no native fishes have been seen there' (Irene Shipway 1950, reporting on a visit made in 1949); Lake Cooloongup or White Lake (Robinson 1951); Ellendale Pool, Greenough River (Watson 1958) and Benger Swamp (Sedgwick 1973). In addition, the species is listed for Western Australia by Main and Edward (1968), but without particulars.

My own notes on *Gambusia* are incomplete as I also despised it, but I can add the following localities: Garden Island (February 1959), Walyunga

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Pool, Swan River near Upper Swan (April 1960), pool in Greenough River near crossing of Geraldton-Mullewa road (December 1962), dam on Brookton road near 27 mile post, Canning River drainage (January 1963), Blackwood River at Sue Bridge (April 1968), Margaret River near the town of the same name (repeatedly in 1968, 1974, 1975), lake near Darkan (October 1968), Pallinup River at bridge of the new road from Albany to Jerramungup (November 1968), Abba River, Wonnerup (March 1975), Ellen Brook between Yallingup and Margaret River (March 1975, not present in 1968), and Narrogin (April 1975).

Information received from Mr Scott of the Zoology Department, University of Western Australia, is that in his institute samples are present as follows: Warren River (May 1964), Beaufort Inlet (October 1971), Murray River near Quindanning (February 1971, March 1972), Williams River, Williams (April 1972, April 1973), Narrogin (April 1973), bed of Avon River, York (May 1973), Lake Leschenaultia (1974), Gogerug Lake (December 1974), Collie River at crossing of South West Highway (October 1975), lakes Banganup, Joondalup, Jandabup and swamps nearby (October 1975), Wooroloo Brook at Gidgegannup (October 1975), small creek on S. end of Garden Island (October 1975).

In the collection of the Western Australian Museum, Dr Allen (*in litt.*, 15.10.1975) was unable to locate a single *Gambusia* specimen; he added: 'About eight months ago we had a big re-organization of the collection. Because of critical lack of storage space many of our uncatalogued *Gambusia* holdings were discarded'. Better proof that museum authorities hold the species in no high esteem could scarcely be provided. In fairness it should be stated, however, that there must also be catalogued specimens, but that in connection with the re-organization these are at the moment not accessible. Later, Dr Allen (*in litt.*, 20.4.1976) informed me that he had found a sample of *Gambusia* in the collection from Hutt River (October 1966), which is important as the northernmost locality from where the species is known in Western Australia.

Undoubtedly, the above list of localities is very incomplete, but the information at present available is enough to show that *Gambusia* is distributed throughout the south-west of the State, from the Hutt River to the Pallinup River, and that it has infested several major river systems: Greenough, Swan, Margaret and Blackwood Rivers.

The genus *Gambusia* is by no means well known systematically and new species are still being described. The specimens examined agree with the

description of *G. affinis* given by Rosen & Bailey (1963) and at present there is no evidence that other species occur in Western Australia.

An attempt was made to find out more about the introduction of *Gambusia affinis* in Western Australia. The introduction in Australia as a whole has not been particularly well-documented, but what is known was summarized by Wilson (1960). It appears that the first liberations in Australia took place at Brisbane in 1925 and in New South Wales from 1926 onwards. In Western Australia the first liberation was made in 1934, when an amateur pisciculturist, who mercifully remains anonymous, released specimens in irrigation ditches at Nedlands. Later, introductions were made to other areas around Perth, apparently by health authorities, and in 1940 to Broome (does it still occur there?). Wilson's information on introductions to Western Australia was received from D.J.R. Snow, at the time Commissioner of Public Health.

In striking contrast to the high praise bestowed on *Gambusia affinis* by many health authorities (see Wilson 1960), is the verdict of ichthyologists. Whitley (1951) declared it to be: 'a general pest' and added some bitter words about its influence on native fish, and Lake (1971) observed: 'The mosquito fish was purposely introduced earlier this century . . . in the mistaken belief that they would control mosquitos. I believe that their effect on mosquitos has been negligible'.

Although they did not state it clearly, the remarks made by Shipway, quoted above, imply that there is a relation between the presence of *Gambusia* and the absence of native fishes. Later, in a newspaper article, Shipway (1959) was much more outspoken. I have also come to expect that in localities where *Gambusia* is plentiful, native fishes are scarce. In some places, such as the Abba River, we found *Gambusia* together with Pigmy Perch, *Nannoperca vittata*, and both species were common. In the Pallinup River, in slightly brackish water, it was associated with Atherinidae, *Galaxias* sp.<sup>1</sup>) and *Lizagobius olorum*.

<sup>1</sup> This *Galaxias* cannot be identified with any species of its genus hitherto recorded from Western Australia. In 1968 I found it common or even plentiful in the Pallinup, West and Jerdacuttup Rivers, all rivers draining to the south. Originally I was inclined to identify these specimens with *G. maculatus* = *G. attenuatus*, but they differ in proportions (the fins are smaller), and some specimens that were X-rayed showed only 52-53 vertebrae, which seems very low for non land-locked populations of *G. maculatus* (cf. McDowall 1972). The problem of the identity of this *Galaxias* is not relevant to the matter here discussed and will be dealt with elsewhere.

I am not aware that much research has been done in Australia on the influence of *Gambusia* on other fishes, and certainly nothing has been done in Western Australia, although mention should be made of an unpublished thesis by Griffiths (see references), a work I have been unable to consult. In other parts of the world there is, however, ample evidence of the damage it can do. To quote from Myers (1965a): 'Almost everywhere that *Gambusia* has been introduced, it has gradually wiped out most or all of the smaller native mosquito-destroying species'. Menon (1976) referred to several pertinent cases of damage that have been recorded in Indian literature. The unique native freshwater fish-fauna of south-western Australia would, because of its very limited range, be particularly vulnerable, especially as the expansion of *Gambusia* occurs simultaneously with land-clearing and increasing pollution of the remaining freshwater. At present the range of *Gambusia* already encompasses the ranges of all the more interesting native species; the main and perhaps the only chance of survival of the latter would be in fast-running streams, which is a habitat not attractive to *Gambusia*.

It will be noted that although generally speaking there is much understanding in the State of the danger of indiscriminate introductions, public services like local health councils could apparently make introductions of a great ecological impact without referring to, let alone consulting, the Department of Fisheries and Wildlife or any zoologist. Evidently there is still a great deal of ignorance of the statutory requirement that exists in prohibiting the import of live fish into Western Australia, except under licence.

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