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Records of Exotic Fishes from Idaho and Wyoming

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Abstract—One exotic poeciliid (Xiphophorus helleri) and two cichlids (Cichlasoma nigrofasciatum and Tilapia mossambica) are recorded as recently established in thermal springs and their outflows in southern Idaho. Misgurnus anguillicaudatus was collected and is considered as established in the Boise River system. Poecilia mexicana and juvenile hybrid tilapias are recorded from the Bruneau River at Bruneau Hot Springs, Idaho. A reproducing population of X. helleri was found in a spring within the boundaries of Grand Teton National Park, Wyoming. Poecilia reticulata, previously reported from one spring each in Idaho and Wyoming, is recorded from a second spring outflow in Idaho.

Simpson and Wallace (1978) and Baxter and Simon (1970) listed the guppy, Poecilia reticulata Peters, as the only tropical exotic fish established in Idaho and Wyoming. It was known from a thermal spring in the Little Lost River Valley north of Howe, Butte County, Idaho (Linder 1964), and Kelly Warm Springs, Teton County, Wyoming (within Grand Teton National Park).

As part of a continuing investigation of established exotic fishes in the United States, we (WRC, CRR, RMB) collected fishes from two warm springs in southern Idaho on 7 September 1985, a chilly, rainy day, air temperature 11 C. The first collection site was Warm Springs Creek, Clark County, T11N, R32E, 17.9 km north of Idaho State Highway 22, about 0.5 km from the spring head; temperature was 25.5 C at the site and 27.7 C at the spring. The second site was Barney Hot Springs, Custer County, T12N, R25E, Little Lost River Valley, 67 km north-northwest of Howe. Temperature in the spring was 27 C in shallows along the perimeter.

Two additional collections of fishes were made by WRC and JED in southwestern Idaho on 26 and 27 September 1986, respectively. The first was in a heavily vegetated irrigation ditch, the Harton Davis Canal, Ada County, T4N, R1W, along the northeastern edge of Eagle State Park; canal temperature was 17 C. The second was made in the Bruneau River below the Blackstone Grasmere Road bridge, Bruneau Hot Springs, Owyhee County, T7S, R6E; water temperature was 15 C in the river, 20–22 C in the collecting area, and 23 C in a thermal inflow just upstream of the collection site.

Fishes were sampled by WRC in Kelly Warm Spring, 1.6 km north-northeast of the town of Kelly, Teton County, Wyoming, T42N, R115W, on 23 July 1984. Additional observations were made from the surface on 13 September 1985. Temperature in this spring is nearly constant, 25–27 C (P. S. Hayden, personal communication).

Methods and Materials.—Fishes were sampled in each spring system and the

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irrigation ditch with galvanized minnow traps (44 × 25 cm, 6.4-mm mesh). Canned dog food was used in traps as bait in the two Idaho springs, and bread was used at the Wyoming site; traps placed in the irrigation ditch were unbaited. Trapping time was 30 minutes in Warm Springs Creek, about 45 minutes in the irrigation ditch, and one hour in the other springs. Fine mesh dipnets also were used at the two Idaho springs and their outflows, and nylon minnow seines (4.6 × 1.8 m, 6.4-mm mesh) were used in the Bruneau River. Approximately 75% of the Kelly Warm Spring pool was observed underwater using face mask and snorkel during the trapping period; additional surface observations were made on 13 September 1985 from the pool perimeter with polaroid glasses.

Standard length measurements were taken to the nearest mm with dial calipers. Specimens are deposited in the collections of Florida Atlantic University (FAU), University of Michigan Museum of Zoology (UMMZ), and University of Nevada at Las Vegas (UNLV).

RESULTS

Idaho

Fishes collected in the narrow (about 0.75–1.5 m) Warm Springs Creek included 120 guppies (13–36 mm SL, UMMZ 213369 and FAU WRC-ID-1) and 121 green swordtails, Xiphophorus helleri Heckel (19–66 mm SL, UMMZ 213370 and FAU WRC-ID-1). No native fishes were seen or collected. The spring head and its immediate outflow doubtless provide thermal refuge during winter months.

In Barney Hot Spring and the upper end of Barney Creek, we collected 29 guppies (13–27 mm SL, UMMZ 213371 and FAU WRC-ID-2), 95 green swordtails (14–36 mm SL, UMMZ 213372 and FAU WRC-ID-2), 19 amelanic convict cichlids, Cichlasoma nigrofasciatum (Günther) (15–92 mm SL, UMMZ 213373 and FAU WRC-ID-2), and 142 Mozambique tilapia, Tilapia mossambica (Peters) (19–78 mm SL, UMMZ 213374 and FAU WRC-ID-2). Within the spring, all fishes were collected from and observed in the perimeter shallows. Guppies were not as numerous as reported by Linder (1964) and were rare in the pond. Tilapia nests were located primarily at the southern end of the approximately 15-m-diameter spring pool, near the outflow (Barney Creek). Guppies, swordtails, and a few convict cichlids were found in the creek, the cichlids only near the pond outflow. No other fishes were observed or collected at this location. Apparently the introduction of cichlids has resulted in the near elimination of guppies from the pond.

One Oriental weatherfish, Misgurnus anguillicaudatus (Cantor) (102 mm SL, UNLV 1951), was collected from Harton Davis Canal near Eagle.

A pair of shortfin mollies, Poecilia mexicana Steindachner, (♂ 35 and ♀ 40 mm SL, UMMZ 213783) and 10 juvenile tilapias (17–23 mm SL, UNLV 1952), probably hybrids of Tilapia mossambica × T. hornorum Trewavas, were captured in the Bruneau River at Bruneau Hot Springs. The collection site was adjacent to a thermal inflow (23 C) that drains from ponds of a nearby aquaculture facility. In addition to the two exotic species, common carp, Cyprinus carpio Linnaeus, and orange-spotted sunfish, Lepomis humilis (Girard) were taken. Native fishes in the area included redside shiner, Richardsonius balteatus (Richardson) (abundant), chiselmouth, Acerocheilus alutaceus Agassiz & Pickering, northern squawfish, Ptychocheilus oregonensis (Richardson), and large-scale sucker, Catostomus macrocheilus Girard (all common). Collections were made in water to 1 m in depth.

Wyoming

Sixty-five guppies (18–35 mm SL, FAU WRC-WY-1) and 203 green swordtails (15–68 mm SL, FAU WRC-WY-1) were collected in minnow traps from Kelly Warm Spring. Also collected and released were 37 Utah chubs, Gila atraria (Girard), and 2 speckled dace, Rhinichthys osculus (Girard).

Observations using face mask and snorkel showed that Utah chubs were common over open areas and near vegetation in the southwestern part of the Y-shaped spring pool (approximately 110 × 24 m; P. S. Hayden, personal communication). Speckled dace were observed primarily around spring boils over open sand and fine gravel, away from the pool perimeter. Green swordtails were common in the perimeter shallows and abundant in aquatic vegetation along the southeastern shore; guppies were also concentrated at the
latter site. Both exotics showed the same distribution when the pool was observed from the surface in 1985.

**Discussion**

These records of green swordtails are the first for Idaho and Wyoming, and those of Oriental weatherfish, shortfin mollies, convict cichlids, Mozambique tilapias, and hybrid tilapias are the first for Idaho. Introductions of guppies, the other tropical exotic fishes except hybrid tilapias, and the Oriental weatherfish resulted from releases of aquarium fishes. Juvenile hybrid tilapias escaped from a culture facility. Cichlids were reported to have been released in Kelly Warm Spring, Wyoming (P. S. Hayden, personal communication), but none was observed or collected.

No native fishes were collected at the Idaho springs. That native species occupied those waters in recent times is doubtful. Barney Hot Spring is isolated from the Upper Snake River by the Lost River Sinks downstream, and its outflow sinks below the surface before entering the Little Lost River (Linder 1964). Moreover, there is an absence of warm-water fishes. Simpson and Wallace (1975) indicated only salmonids and shorthead sculpin, *Cottus confusus* Bailey & Bond, as native in the Little Lost River drainage of Idaho.

The Oriental weatherfish was the only fish collected from the irrigation ditch at Eagle State Park. V. K. Moore (personal communication) reported the presence of an unidentified "Chinese loach" in the Boise River system and added that it had been there for several years, with a few specimens having been captured. Although we collected only one specimen, we consider the species as established. Self-sustaining populations of this exotic are also present in California and Michigan (Courtenay et al. 1986).

The capture of a pair of shortfin mollies in the Bruneau River in the same shallow, vegetated, warm inflow area of the river from which the juvenile *Tilapia* were collected may indicate that this species is established immediately upstream in Indian Bathtub, an area of inflowing thermal water. Poeciliids have been reported previously from Bruneau Hot Springs (V. K. Moore, personal communication), and we believe Indian Bathtub is the most likely site where they were seen or collected. Shortfin mollies are established in California and Nevada (Courtenay et al. 1986). The species was also reported as established in Trudau Pond, Madison County, Montana (Brown 1971), but no specimens were collected there in September 1985.

Tilapia culture in thermal waters in southern Idaho has expanded recently. Blue tilapia, *Tilapia aurea* (Steindachner), have been cultured for several years in Hagerman Valley, Twin Falls County, and may have established following escape in the Snake River near natural thermal inflows (V. K. Moore, personal communication). A similar situation occurred in Pennsylvania where escaped blue tilapia established in the lower Susquehanna River and now overwinter near power plant thermal effluents (Skinner 1954, 1956). The culture facility near Bruneau Hot Springs seemed to be of recent construction. The "red" tilapias being cultured there appear to be a hybrid that is being used increasingly in aquaculture operations in Idaho and elsewhere. If this hybrid is fertile, as many tilapia hybrids are, we predict that it will become established near thermal inflows in the Bruneau River.

Kelly Warm Spring drains into the upper Snake River via Mormon Row Ditch into downstream Ditch Creek. A second irrigation ditch, Savage Ditch, permits water to be diverted from the Gros Ventre River into Mormon Row Ditch, just below the outflow from Kelly Warm Spring. The spring was excavated in the late 1940s for the purpose of increasing flow into those ditches (P. S. Hayden, personal communication). A flow-control structure separates the spring pool from the ditches.


No Utah suckers were collected or observed in Kelly Warm Spring in July 1984. Although suckers are not easily trapped, adults are generally readily observed underwater (Courtenay et al. 1985). Suckers may have been present near the outflow structure, the only area of the spring pool not observed with mask and snorkel. P. S. Hayden
(personal communication) indicated that they were seen in the pool some five to six years prior to 1984. He also stated that the structure is opened periodically and, depending on outflow volume and speed, could permit entry from the ditches.

Most of the exotic fishes reported herein are restricted to warm waters and do not appear to represent a threat to native fishes in Idaho or Wyoming. Nevertheless, they serve as additional examples of unauthorized introductions, even in areas remote to civilization and, in one case, within a national park. Obviously, those persons introducing these tropical fishes go to considerable lengths to establish them. In the Boise and Bruneau rivers, and in Kelly Warm Spring, sympathy with the native fauna could lead to adverse consequences. Introductions in similar situations in other states have been implicated in the decline and extinction of native fishes (e.g., Miller 1961, Minckley and Deacon 1968, Deacon et al. 1964, Lachner et al. 1970, Deacon 1979, Courtenay and Deacon 1982, Courtenay et al. 1985, Heckmann et al. 1987).

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LITERATURE CITED


