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Sympatric Occurrence of Eubranchiopoda in Ephemeral Pools: A Comment

ABSTRACT.—Debrey *et al.* (1991) observed what they thought was the atypical occurrence of three species of Eubranchiopoda, each belonging to a different order in a vernal prairie pond in southeastern Wyoming. Co-occurrence of Eubranchiopoda in ephemeral pools is not unusual. Evidence of multi-species temporary pool communities is presented, along with a brief discussion of what may structure ephemeral pond communities.

Debrey *et al.* (1991) reported what they believed to be the uncommon co-occurrence of three Eubranchiopod orders (Notostraca, Anostraca and Conchostraca) in an ephemeral pond in SE Wyoming. This observation was not unusual. Horne (1967) surveyed branchiopods throughout Wyoming, and found diverse communities at most sites. “Almost all phyllopod combinations were recorded in the prairie habitats, and frequently . . . all prairie species were found inhabiting the same pond” (Horne, 1967, p. 474). Prairie species included five species of Anostraca, two species of Conchostraca, and the Notostracan *Triops longicaudatus* Le Conte. Debrey *et al.* (1991, p. 399) state: “This is the first documentation of *Leptesteria compleximanus* in Wyoming, and the first report of *T. longicaudatus* in the state since the late 1800s.” Horne (1967) lists *L. compleximanus* Packard as occurring in 11 prairie ponds, and *T. longicaudatus* in 17 ponds in Wyoming. In at least 10 ponds, Horne lists a Eubranchiopod community of seven species, consisting of four species of Anostraca, two species of Conchostraca, and *T. longicaudatus*.

Eubranchiopod communities in ephemeral pools with at least one species in each of three orders have been reported in a number of studies (*e.g.*, Horne, 1971; O’Brian and DeNoyelles, 1972; McKay *et al.*, 1990). Sublette and Sublette (1967) described diverse communities of up to seven branchiopod species in three orders in New Mexico playa environments. Dodson (1987) lists five species of branchiopods in rock pools in Utah, two species each of Anostraca and Conchostraca, and *Triops longicaudatus*. In my own work with A. K. Dunlap in the same area, Anostraca (*Branchinecta packardii* Pearse, with or without *Streptocephalus texanus* Packard) occurred in all 84 pools surveyed, Conchostraca (*L. compleximanus* with or without *Eulimnadia inflecta* Mattox) were found in 68 pools, and *T. longicaudatus* was present in 74 pools. All three orders were observed in the same pool at the same time in 61 pools.

Presence or absence of a species in a pool depends in part on random dispersal of propagules via wind or perhaps animals (Maguire, 1963; Proctor, 1964; Proctor and Malone, 1965; Proctor *et al.*, 1967; Moore and Faust, 1972; Daborn, 1976). The establishment and maintenance of viable populations is, however, determined by physicochemical conditions and biotic interactions during each wet cycle.

Co-occurrence of branchiopods in ephemeral pools is not unusual. In fact, it is the lack of co-occurrence in either space or time that provides opportunities for exploring physical and biological factors involved in structuring ephemeral pool communities (*e.g.*, Horne, 1967, 1971; Belk and Cole, 1975; Donald, 1983; Kulp and Rabe, 1984; Belk, 1991; Dodson, 1987; Hamer and Appleton, 1991). The significance of observations by Debrey *et al.* (1991) is not the occurrence of three species of branchiopods together in one pond, but that two of these species were absent from three ponds examined in the area. Community composition varies—spatially among pools and temporally in the same pool (Prophet, 1963; Sublette and Sublette, 1967; Horne, 1967, 1971; Bernice, 1972; Belk, 1977; Donald, 1983; Dodson, 1987; Mahoney *et al.*, 1990; Debrey *et al.*, 1991). Research is needed to determine what causes this variability.

The ecology of ephemeral pools is fascinating, but still relatively poorly understood. Observations of community composition in a collection of pools such as made by Debrey *et al.* (1991) can provide the basis for more detailed work to help elucidate the mechanisms that structure ephemeral pool communities.

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