width, body width, caudal peduncle length, and pectoral fin length (Table 15).

Of the characters that exhibit clinal variation (pattern 3 above), only two, anal rays (Table 9) and index of anterior dorsolateral scale reduction (Table 11), decrease in value from east to west to northwest. In both these characters the Mobile Bay and Biloxi-St. Louis Bays populations, although not adjacent, are similar, and they differ from surrounding drainages. The other characters fitting pattern 3 tend to increase in value toward the west. These characters are preoperculomandibular canal pores (Table 10), postdorsal length, pelvic fin length, body depth, caudal peduncle depth, and dorsal fin length (Table 15). In the latter three there is an unusually large "step" in the cline between the Lake Pontchartrain and Mississippi Valley populations.

North-south or upstream-downstream clinal variation usually is assumed to be a phenotypic and/or genetic response to ecological factors, usually temperature, occasionally light, which vary clinally in the same direction. East-west clinal variation along the Gulf slope does not fit neatly into any such scheme. This is especially true for *N. roseipinnis;* the linear extent of its range covers no more than 250 miles in regions of three states with presumably similar meteorological conditions. Bailey and Suttkus (1952:11-12) reported an irregular east-west gradient in the anal ray count of *Notropis signipinnis,* though in their example the number increased toward the west. Thomerson (1966) also noted east-west clinal variation in Gulf slope populations of *Fundulus olivaceus* (Storer). Taylor (1969) reported clinal west to east increases along the Gulf Coast in number of pectoral rays in *Noturus leptacanthus* Jordan and in number of anal rays and vertebrae in *Noturus funebris* Gilbert and Swain.

Variation in the total index of fin pigmentation (Tables 12 and 13) is complicated and does not fit any of the patterns discussed above. The three eastern drainages have low values and are similar, but in all cases except breeding males below 40 mm SL, the Mobile Bay population averages the lowest. The amount of fin pigment is greatly increased in the Pearl drainage as shown by its high index values. The index drops off abruptly to intermediate values in the Lake Pontchartrain drainage. In the Mississippi basin the index is high in the Big Black and very high in the Bayou Pierre. In most cases an increase in index value is accompanied and partially explained by a stronger tendency for the amount of fin pigment to increase with size (Figs. 5, 6).

It is generally recognized that deposition of melanin can be affected by ecological factors. Specimens from dark-stained water are often unusually dusky, whereas the same species from white (colorless) or turbid