

**Variation in Age-at-Recruitment Can Drive Recruitment Dynamics:
the Example of *Sicydium* spp. (Pisces: Gobiidae) in Dominica,
West Indies¹ ³
(Abstract)**

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Abstract—Early life history can influence recruitment through a mechanism not previously identified. Age-at-recruitment (AAR) was shown by otolith evaluation and periodic regression to vary seasonally in *Sicydium* spp. in Dominica, West Indies. These species reproduce and recruit pan-seasonally, making them ideal study species for recruitment-dynamic problems. Although pan-seasonal, there is a pronounced peak season for recruitment not adequately explained by variation in reproduction. We used numerical simulation to explore the potential of seasonal variation in age-at-recruitment to influence recruitment seasonality. From this we show that with temporally constant reproduction, AAR variation can cause large variations in recruitment; when coupled with realistic (but temporally constant) daily survival rates, recruitment can vary ten- to twenty-fold or more. The recruitment variation is caused by two allied processes usually acting together: a Doppler-like effect and a compounding of prevailing mortality over variable time. Thus, AAR should not be assumed constant, and temporal variation in AAR should be considered as a source of otherwise unexplainable recruitment variation. This phenomenon may occur in many other taxa, and becomes more easily detected as the duration of the spawning and recruitment seasons increases. At present there are insufficient data to determine whether long-term changes are occurring in growth rates and age-at-recruitment; this is principally because otoliths are destroyed by conventional preservation. There is a need to develop collections of properly preserved otoliths which can later be analysed, and this collection can begin with each interested scientist, with very little expense.

¹ASIH symposium on freshwater gobies

