



## Resurrection and redescription of *Squalus suckleyi* (Girard, 1854) from the North Pacific, with comments on the *Squalus acanthias* subgroup (Squaliformes: Squalidae)

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### Abstract

A taxonomic re-evaluation of the status of the North Pacific *Squalus suckleyi* (Girard, 1854) combining the use of meristic, morphological and molecular data reveal this species to be clearly distinct from the widespread *Squalus acanthias* (Linnaeus, 1758). Differences in the external morphology between *S. acanthias* and *S. suckleyi* are subtle and are likely to be masked by intraspecific variation within individuals. However, we found *S. suckleyi* to differ from *S. acanthias* based on the following morphological and meristic characteristics: a short, broadly-rounded to acute snout; first dorsal-fin midpoint more posterior to pectoral-fin insertion; pelvic-fin origin closer to second dorsal fin than first dorsal fin; total vertebral counts average 99 (97–106). Molecular analysis of approximately 650 bp of the CO1 mitochondrial gene (DNA barcode region) showed separation of *S. suckleyi* and *S. acanthias* into two distinct genetic clades with 98% bootstrap support. Within species genetic diversities were  $0.109 \pm 0.036\%$  and  $0.176 \pm 0.041\%$  for *S. suckleyi* and *S. acanthias* respectively; between species diversity was 5–6 fold greater at  $0.765 \pm 0.307\%$ . *Squalus suckleyi* is thus resurrected and a neotype for this endemic North Pacific *Squalus* species is designated.

**Key words:** Squalidae, *Squalus suckleyi*, morphometrics, meristics, DNA barcode, neotype, endemic

### Introduction

The family Squalidae (Chondrichthyes: Squaliformes) is one of the more taxonomically problematic shark groups. The family includes two currently recognized genera, *Cirrhigaleus* with three species and *Squalus* with 24 species subdivided among three well define species subgroups as detailed in Ward *et al.* (2007) (Table 1). These subgroups include the *Squalus acanthias* group (Group A of Bigelow & Schroeder, 1948), with one species generally recognized, *Squalus acanthias* Linnaeus, 1758, but with numerous synonyms. Regional subspecies have been proposed within this subgroup for the North Atlantic, North Pacific, Black Sea, and the west coast of southern Africa. The *Squalus mitsukurii* group (Group B of Bigelow & Schroeder, 1948) was formerly termed the *blainville-fernandinus* group, *S. fernandinus* group, or *S. blainville* group, but changed due to identification problems with *S. blainville* (Risso, 1827) and the synonym of *S. fernandinus* Molina, 1782 with *S. acanthias*. This group includes at least 15 species including the nominal *S. blainville sensu* Chen *et al.* (1979) from the western North Pacific. The *Squalus megalops* group (Group C of Bigelow & Schroeder, 1948) also termed the *brevirostris-cubensis* group, with *S. megalops* (Macleay, 1881) possibly representing a species complex, *S. cubensis* Howell Rivero, 1936 from the North Atlantic, *S. acutipinnis* Regan, 1908 from