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Regional Variation in *Laoma* (*Phrixgnathus*) *sciadium* (Pfeiffer)  
(Gastropoda: Laomidae)

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*Abstract*

THE species occurs in the Auckland Peninsula from the North Cape-Cape Reinga area to the vicinity of Warkworth. A study of materials from some thirty sites throughout this range reveals considerable variation in form, coloration, and sculpture. North of the Rawene-Taheke-Kerikeri line a shell sculpture of numerous, fine, oblique, radiate striae produces a silky texture which contrasts with the smoother, shiny appearance of forms to the south.

INTRODUCTION

ALTHOUGH the distribution of *L. sciadium* is relatively limited, there is a considerable degree of variation in form and sculpture. Suter (1913) gives the localities—Tom Bowline's Bay; Whangaroa; Whangarei; and Broadwood. Hutton (1883) in his reference to this species from Seventy Mile Bush, Wellington, is obviously confused with *L. mariae* (Gray). The present work is based on a collection of specimens from some 30 sites in the Auckland Peninsula which indicates that the species occurs from the North Cape-Cape Reinga area in the north to the Wellsford-Warkworth district in the south.

*L. sciadium* may be found quite commonly on the forest floor in undisturbed areas. It prefers pockets of decaying leaf in communities including tree ferns, and is often taken beneath small pieces of rotting wood. Albino specimens are found occasionally.

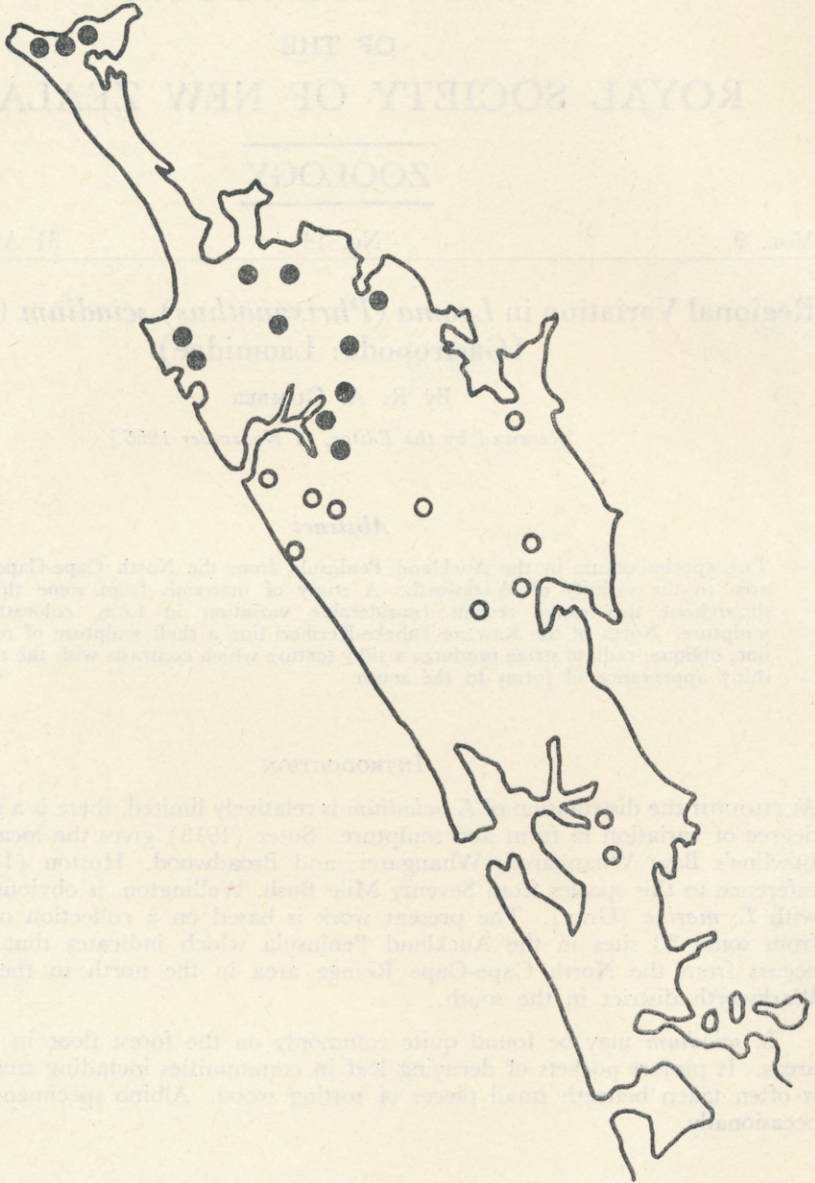
METHODS

Protoconch and whorl-width measurements (micrometer eyepiece—1mm = 125 units) as used in the studies on *L. mariae* (Cumber, 1966) have been made on samples of six specimens taken from ten localities involving much of the range of the species. The data are summarised in Table I. A graphical representation of the averages is shown in Text-figure 2 which indicates the extremes of variation for the species. Camera lucida configuration diagrams for 12 forms are given in Text-figure 3, while dorsal and ventral views of some of these are shown in Figure 1.

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● DULLER STRIATED FORMS

○ SMOOTHER SHINY FORMS

TEXT-FIG. 1.—Collection sites for *L. sciadium*.

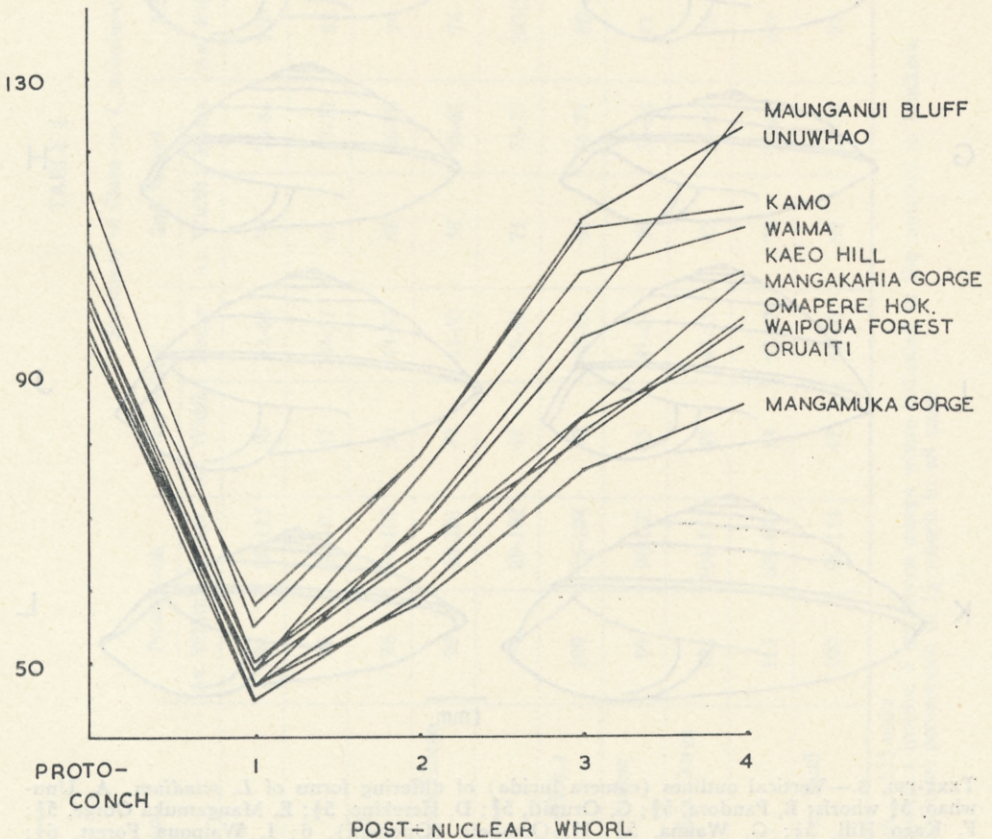
Material from the following collections has been examined. Unless otherwise indicated, collections were made by the author. Ahipara Saddle 1.10.57; Dome Valley 12.7.66; Herekino 22.9.58; Horeke 1.11.66; Kaeo Hill 19.9.58; Kamo —, 12.37; Kohuroa 3.2.63; Mangamuka Gorge 17.1.57; 25.9.58; 1.10.59; 17.10.62;



Maunganui Bluff 22.1.57; Mangakahia Gorge 25.9.58; Mitimiti 1.10.57; Omapere, Hokianga -40; Oruaiti 22.9.58; Pandora, 13.1.57; Parakao 19.10.62; Rangiahua 1.11.66; Rawene 1.11.66; Spirit's Bay -12.50; 11.1.57; Unuwahao 12.1.57; 18.1.66 (B. M. May); Waiare 19.9.58; Waikare, B.O.I. 24.9.60; Waima -40; Waimatenui 2.10.59; 9.3.62; Waipoua Forest 21.1.57; 22.9.58; 22.10.62; Wellsford, -12.48; Whangarei -12.48.

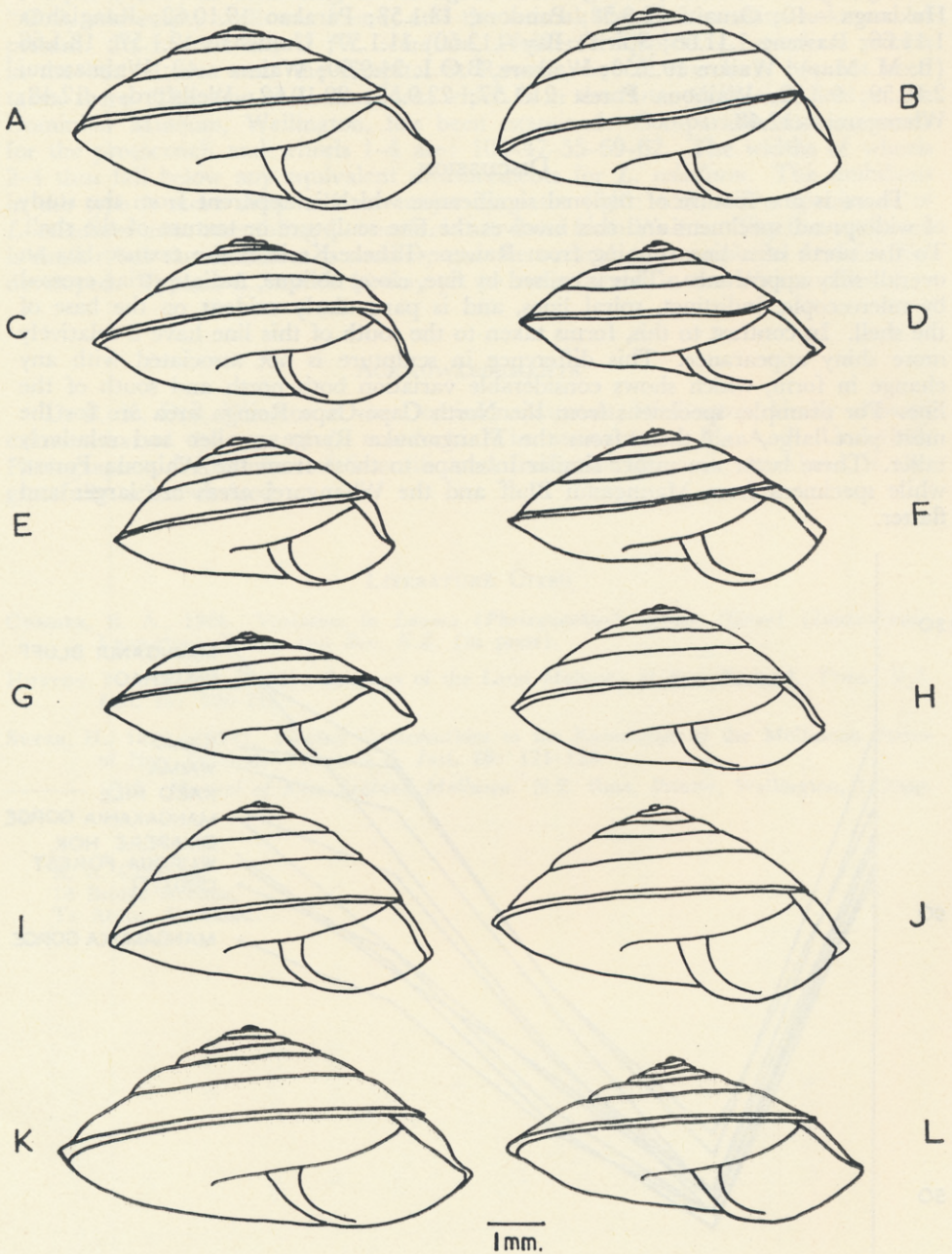
DISCUSSION

There is one feature of regional significance which is apparent from the study of widespread specimens and this involves the fine sculpture or texture of the shell. To the north of a line running from Rawene-Taheke-Kerikeri the texture has an overall silky appearance. This is caused by fine, close, oblique, radiate striae crossed by microscopic, indistinct, spiral lines, and is particularly evident on the base of the shell. In contrast to this, forms taken to the south of this line have a relatively more shiny appearance. This difference in sculpture is not associated with any change in form, which shows considerable variation both north and south of the line. For example, specimens from the North Cape-Cape Reinga area are for the most part large, and those from the Mangamuka Range smaller and relatively taller. These latter are rather similar in shape to those from the Waipoua Forest, while specimens from Maunganui Bluff and the Whangarei areas are larger and flatter.

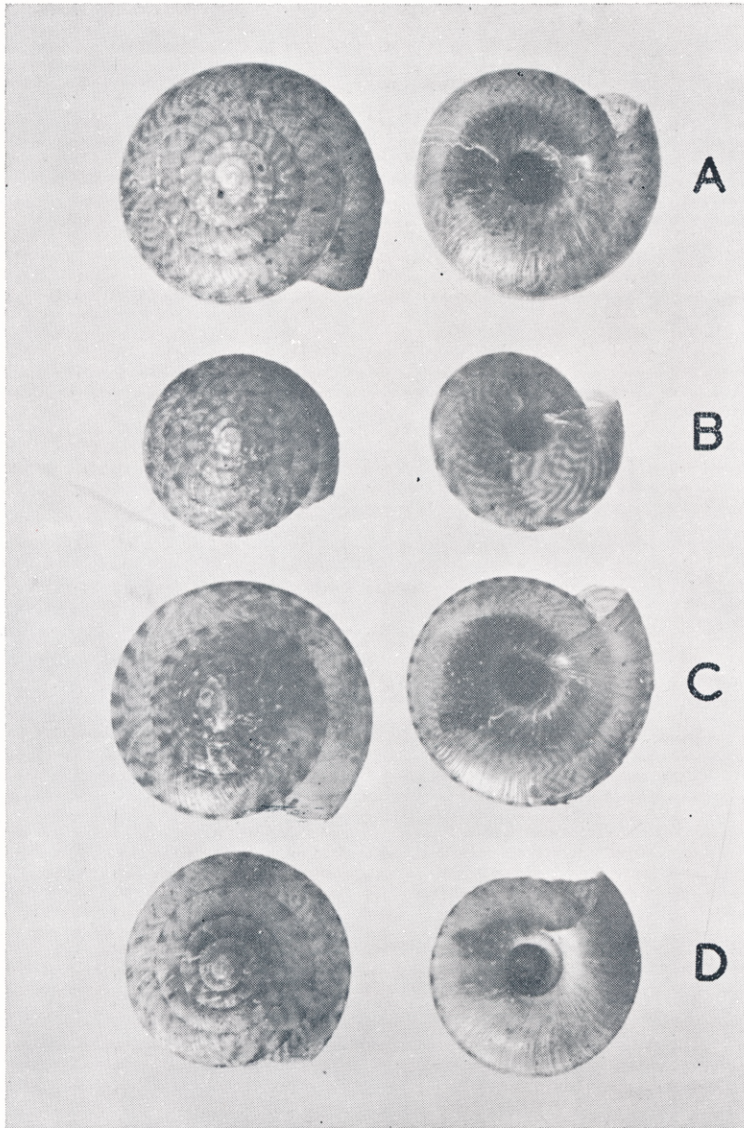


TEXT-FIG. 2.—Widths of protoconch and whorls in samples from 10 widely separated localities. Values shown are averages for six specimens except in the fourth whorl—see Table 1. Measurements were made with a micrometer eyepiece: 1mm = 125 units.





TEXT-FIG. 3.—Vertical outlines (camera lucida) of differing forms of *L. sciadium*. A, Unu-whao,  $5\frac{3}{4}$  whorls; B, Pandora,  $5\frac{3}{4}$ ; C, Oruaiti,  $5\frac{3}{4}$ ; D, Herekino,  $5\frac{1}{2}$ ; E, Mangamuka Gorge,  $5\frac{3}{4}$ ; F, Kao Hill,  $5\frac{1}{2}$ ; G, Waima,  $5\frac{1}{2}$ ; H, Omapere (Opononi), 6; I, Waipoua Forest,  $6\frac{1}{4}$ ; J, Mangakahia Gorge, 6; K, Maunganui Bluff,  $6\frac{1}{4}$ ; L, Kamo,  $5\frac{1}{2}$ .



Dorsal and ventral aspects of differing forms of *L. sciadium*. A—Unuwahao, North Cape; B—Mangamuka Gorge; C—Kamo; D—Waima.



TABLE I  
Summary of Data on *L. sciadium*\*

Collection Site and Date	Protoconch		1st Whorl		2nd Whorl		3rd Whorl		4th Whorl		No Whorls**	Diam. mm
	Av. Width	Range	Av. Width	Range	Av. Width	Range	Av. Width	Range	Av. Width	Range		
Unuwahao 12.1.57	104	99-115	58	53-64	78	75-84	110	100-120	122	116-134	5½-5¾	5.25-6.25
Oruaiti 22.9.58	96	80-105	47	44-52	62	57-72	83	79-96	93(4)	90-99	5½-6	4.25-5.25
Kaero Hill 19.9.58	96	90-100	50	48-53	68	64-76	94	86-103	103(4)	98-107	5½-5¾	4.75-5.25
Mangamuka Gorge 1.10.59	99	98-101	47	43-50	58	49-65	76	62-87	85	72-92	5½-6	4.25-4.75
Waima 1940	94	89-102	49	45-52	75	73-79	103(5)	95-109	109(1)	109	4-5½	3.75-5.25
Omapere (Hok.) 1940	100	95-104	50	48-53	66	61-77	80	73-96	97	88-109	5¾-6¼	5.25
Waipoua Forest 26.9.58	99	96-102	45	41-49	59	55-64	81	74-86	96	86-103	6-6½	5.25-6.25
Mangakahia Gorge 25.9.58	108	101-117	49	47-51	65	59-69	83	80-88	102	98-108	5½-6¼	4.75-6.25
Kamo —, 12.35	115	109-124	55	52-57	78	70-81	109	101-120	112(2)	110-114	5½-5¾	5.75-6.25
Maunganui Bluff 22.1.57	100	96-114	47	42-50	69	63-78	97	87-106	125	120-135	5¾-6¼	5.75-7.25

1 mm = 125 units

\* Samples involve 6 specimens except where indicated to the contrary in brackets.

\*\* Includes protoconch of 1½ whorls in all cases.



Suter (1893) in describing *L. murdochi* from "Rawene near Hokianga" notes "Only one empty shell was found, and the animal therefore remains unknown at present. Its nearest ally is *Ph. sciadium*, Pfeiffer." Typical *L. sciadium* occurs in the bushed area near the Hospital at Rawene, but *L. murdochi* has not been taken there. The type of *L. murdochi* which is in the Suter Collection held at the Dominion Museum, Wellington, has been examined. Comparable measurements for the protoconch and whorls 1-4 are: 102-47-55-69-62. The widths of whorls 2-4 thus fall below any equivalent measurements for *L. sciadium*. The umbilicus in the type is more than half the major diameter (340: 653). The specimens of *L. sciadium* most resembling *L. murdochi* are those from Waima. The fine sculpture is similar but the umbilicus is smaller, and the sutural and peripheral keel far less developed. Typical *L. murdochi* may yet be rediscovered in the Waima district.

#### ACKNOWLEDGMENTS

Dr R. K. Dell, Director of the Dominion Museum, Wellington, kindly allowed examination of the type of *L. murdochi*. The assistance of Mr A. P. Underhill, Photographer, Department of Scientific and Industrial Research, Auckland, is also gratefully acknowledged.

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