GERMINATION OF LAURACEAE SEEDLINGS IN THE CHIQUIBUL FOREST, 1995-1996: IMPLICATIONS FOR SPECIES DETERMINATION WITHIN THE "SMALL-LEAF LAURELS"

Tony King (1997), unpublished report, Las Cuevas Research Station, Belize.

Introduction

Trees of the family Lauraceae are widely distributed in the Chiquibul broadleaf forest of Belize. Several species are recognised by foresters, and local names have been given to these. The most common Lauraceae tree to be found in the silvicultural plots in the Chiquibul tends to be refered to as "small-leaf laurel" or simply "laurel". Seedling enumeration within these plots has occurred as part of a logging experiment, and the field-workers involved with the seedling enumerations have distinguished three forms of seedling from trees traditionally regarded as the single species "small-leaf laurel". This short paper gives data collected from newly germinated Lauraceae seedlings, as part of the logging experiment, which suggest that "small-leaf laurel" consists of at least two, and probably three, distinct species (or sub-species).

Data collection

Quadrats were set up in 1994 within the silvicultural permanent sample plots (PSPs) of the Belize Forest Department's Forest Planning and Management Programme (Bird 1994). 25 quadrats, of $1m^2$ each, were placed in each of the 8 PSPs, giving a total area of $200m^2$ enumerated. The germination data used in this paper concerns seedlings that germinated between March 1995 and April 1996. Quadrats were enumerated at intervals of about 6 weeks. Time of germination is given as the month during which the seedling was first recorded. Initial height refers to the height (to the nearest cm) from the ground of the highest living point of the seedling when the seedling was first recorded.

Seedling morphology

The three seedling forms of "small-leaf laurel" that were distinguished during the study each had assigned to them a 'nick-name' for ease of use, and a number referring to a voucher specimen of the respective form which was pressed and passed onto the Botany Department of the Natural History Museum (London). The field characteristics used to distinguish between the forms were:

'Smooth laurel' (AKM M4703X):- leaves dull, thicker to the touch than other forms, with slightly depressed upper midrib;
'Laurel rr' (AKM M7147X):-leaves shiny, raised upper midrib; .
'Laurel sg' (AKM D1059X):-leaves shiny, depressed upper midrib, often with long drip-tip.

Distribution of seedlings between plots

The distribution of the three seedling forms was very variable over the 8 plots. The table below gives the total number of seedlings of each form that were recorded during the entire study period in each of the plots. In six of the plots, most of the seedlings were of one form, either 'smooth laurel' (PSPs 12 & 14) or 'laurel rr' (PSPs 15, 16, 17 & 18). 'Laurel sg' represented over 50% of the seedlings at one plot, PSP11, while the final plot, PSP 13, exhibited a relatively uniform density of the three forms.

		Total number of seedlings in quadrats, Jan '95 - Apr '96		
Site	PSP	'Smooth Laurel'	'Laurel rr'	Laurel sg'
Las Cuevas	11	20	13	42
	12	143	1	3
San Pastor	13	18	12	13
	14	166	4	3
Grano d'Oro	15	11	126	11
	16	5	102	10
New Maria	17	1	183	0
	18	3	64	0
Totals		367	505	82

Initial height following germination

During the period March 1995 to April 1996, within the 200 quadrats, 114 seedlings of 'Smooth laurel' germinated, 70 of 'Laurel rr' and 2 of 'Laurel sg'. The mean initial height for 'Laurel rr' was 10.2cm (s=2.40), while that for 'Smooth Laurel' was 7.5cm (s=l. 71), a statistically significant difference ($z=8.11$, $p<0.001$). The 95% confidence interval for the difference between the real means of the two forms was calculated as 2.0 to 3.3cm. The frequency distributions for the two forms are illustrated in figure1. The initial heights of the two 'laurel sg' seedlings were 6cm and 10cm.

Timing of germination

Figure 2 illustrates the timing of germination of the two seedling forms 'smooth laurel' and 'laurel rr' during the study period. It is clear that the 'smooth laurel' seedlings exhibited irregular germination rates over the study period, with a peak of germination activity between July and December, while the 'laurel rr' seedlings germinated at a more regular rate throughout the study period, with perhaps minor peaks of activity in March of both years.

Conclusions

The data presented in this study show significant differences in seedling leaf characteristics, initial height after germination, and timing of germination, between two distinguishable forms of seedlings of Lauraceae trees traditionally referred to as "small-leaf laurel" in the Chiquibul forest. The implication of this evidence is that these two seedling forms are likely to derive from two separate Lauraceae species. A third seedling form has also been distinguished by field-workers, but insufficient data has been collected concerning this form to be able to judge whether it represents a third species. If the taxonomy of the Lauraceae in the Chiquibul is to be determined satisfactorily, mature samples from several trees within areas where each of the seedling forms occur need to be collected and identified.

References

Bird, N.M., 1994, *Silvicultural Research Paper No.* 1: *Experimental design and background information.* Forest Planning and Management Project, Ministry of Natural Resources, Belmopan, Belize.

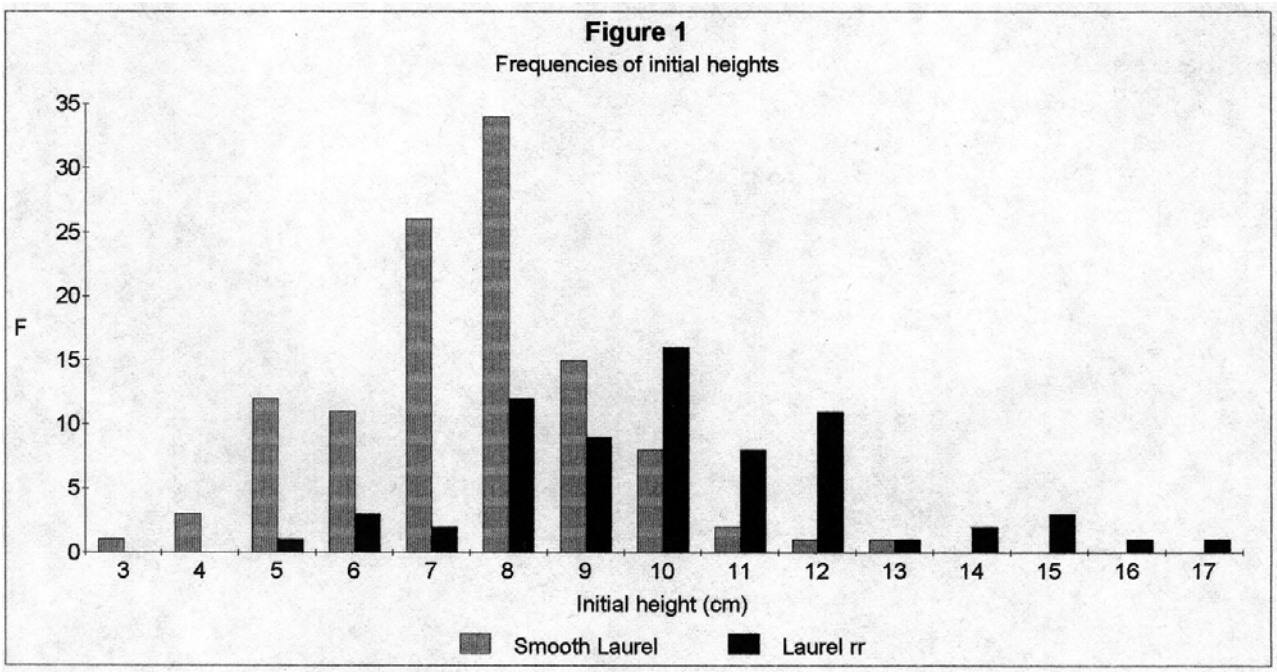
Figure 1
Frequencies of initial heights
F
35
30
25
20
15
10
5
0
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
Initial height (cm)
Smooth Laurel
Laurel rr

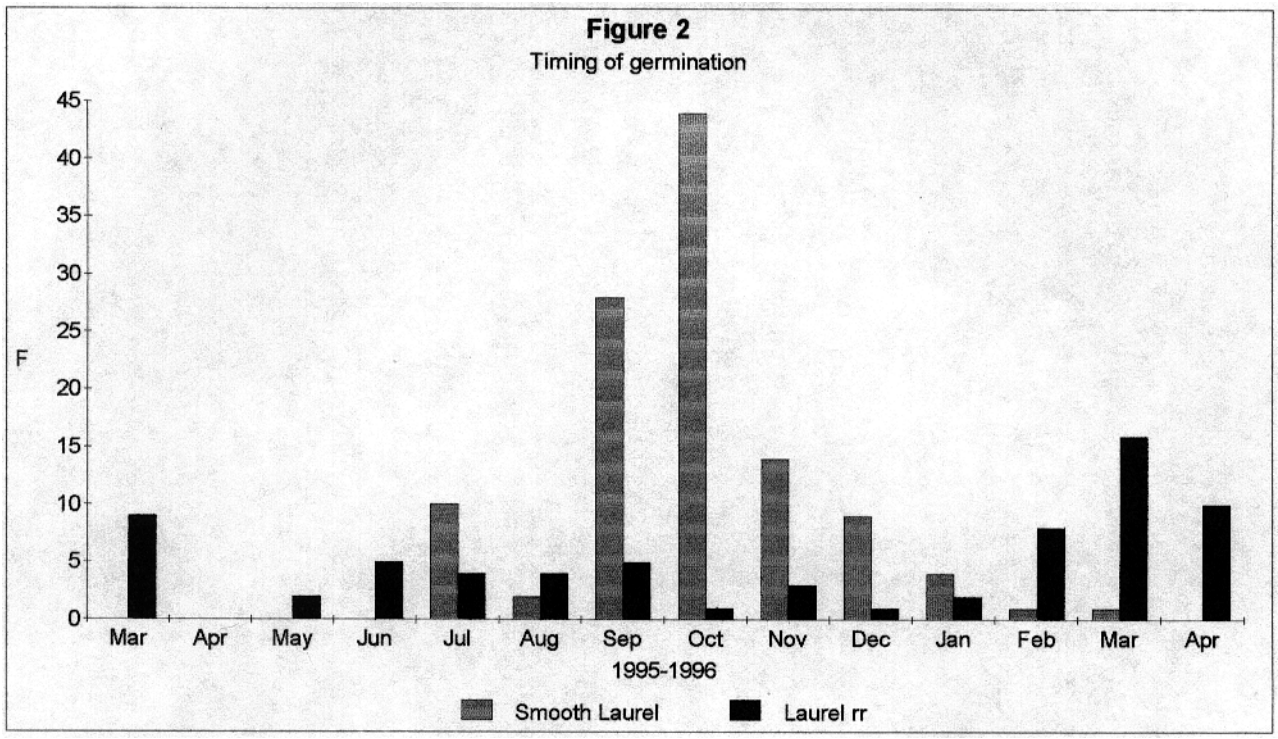
Figure 2
Timing of germination
F
45
40
35
30
25
20
15
10
5
0
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Jan
Feb
Mar
Apr
1995-1996
Smooth Laurel
Laurel rr