Comparing indigenous and European-based concepts of seasonality for predicting macrofungal fruiting activity in Tasmania

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Abstract

This paper examines the concept of seasonality used by a Tasmanian indigenous population and compares it to the notion of seasonality derived from European usage. Lists of macrofungal species from three separate studies in the Warra long-term ecological research (LTER) site in southern Tasmania, where visits were made approximately fortnightly over a period of 12 months in each study, show that the majority of the fungal records and between 62.9–88.4% of the species occurred during the indigenous season Tunna (corresponding to the months of May–August in the European-based calendar) in at least one of the plots (or a portion of a plot) in each survey. Overall, the months of May and June were individually the most prolific, but in years where a dry summer is followed by an early wet autumn, the months of March or April may be better or as good. The type of substrate supporting the fungi was also a determining factor, with wood, soil and litter appearing to have different seasonal requirements. Information such as this may be useful in helping mycologists plan macrofungal sampling protocols.

Key words: Indigenous, weather knowledge, Tasmania, seasonality, sampling, macrofungi.

Introduction

It is well recognised, at least anecdotally, that the most abundant period for the appearance of a majority of macrofungal species in the tall, wet, eucalypt forests of southern Australia is seasonally dependent, with fruit body production occurring after the onset of autumnal rains. Overseas field mycologists planning a trip to Tasmania often inquire about the best dates to visit to maximise their chances of finding macrofungi in fruit. As the exact period of time after the onset of the autumnal rains can vary greatly, it is difficult to be more precise other than to provide some general statement such as "the month of May offers the best overall chances in a typical year" or "June may also be good in the absence of an early, severe frost". In addition to the question of the optimum time for field work, there is the more general question of how to summarise seasonal effects from macrofungal surveys conducted on a year-round basis.

In Australia, the seasons in general use are the four tri-monthly groupings, viz. autumn (March–May), winter (June–August), spring (September–November) and summer (December–February), an adaptation of Northern Hemisphere usage. Clearly, there is no necessary connection between these rather arbitrary boundaries and the appearance of macrofungal fruit bodies. In the Australian context, alternative definitions of seasonality exist that derive from the original inhabitants of this continent. There is evidence that Aboriginal people throughout Australia regarded the beginning of each new season as a period of distinct change in its fauna, flora and climate (e.g., see Jones & Meehan 1997, Rose 1997). Observations on plant growth or wild fruit formation played an important role in defining the boundaries to the seasons, even where the climate was sufficiently different so that the number of distinct seasons differed widely. For example, Davis (1997) found that the number of seasons in Aboriginal "seasonal calendars" in the Northern Territory, based upon weather and its related characteristics of vegetation, animals and insects, varied greatly throughout the Territory. Thus, the Tiwi people of the Bathurst and Melville Islands in the tropical monsoon belt recognised six distinct seasons, whereas the Warlpiri people of the dry interior further south recognised only three main seasons. The Gidjingarli people of Arnhem Land marked the passage of the seasons by noting a complex array of natural phenomena, which included the flowering and fruiting of plants, the passage and nesting of birds, the appearance of different fish species and physiographic changes of the landscape (Jones & Meehan 1997). Aboriginal people in central Australia adapted their culture and economic practices to the prevailing climate and weather patterns, making observations of the new growth of green vegetation, the flowering of plants, and the beginnings of seed growth part of their seasonal calendars (Hoogenraad & Robertson 1997).

There appears to be less information about the use of climate and weather patterns by the Tasmanian indigenous populations, but the evidence that exists suggests that they had considerable knowledge of the weather signs and used the blossoming or flowering of plants as indicators of seasonal change (Plomley 1966). We were interested to examine a seasonal calendar developed by a indigenous Tasmanian population, to see how well the seasons defined there correlate with the seasonal variation of macrofungal richness. The Australian Bureau of Meteorology has a web page devoted to climate, weather and aboriginal culture (see http://www.bom.gov.au/iwk/climate_culture/Indig_seasons.shtml), which compares various definitions used by the original inhabitants of the Australian continent to describe the seasons experienced throughout the course of a year. Table 1 of that web page (viewed on 20 January 2009) compares the definitions of the seasons around Australia to that of the European-type calendar. Because of the diversity of the Australian climate, the number of seasons and their boundaries vary greatly between the monsoon-affected tropics and the cool temperate south. The only definition given in the web

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page that is based upon Tasmanian usage derives from, and relates to, a northeast Tasmanian indigenous population. Their seasons were as follows, with the European-based equivalent months in parentheses: Wegtellanyta (December–April); Tunna (May–August); Pawenyapeena (September–November). Note that there are only three seasons rather than the four seasons in the European-based usage, and that the definition of Pawenyapeena corresponds exactly to the European-based season spring as used in Australia. The definition of Tunna cuts across the boundary of two of the European-based seasons, with its four-month period including the late autumn month of May plus the three months of winter. The remaining season, Wegtellanyta, is the longest, encompassing the three months of summer plus the first two months of autumn in the European-based calendar.

The macrofungal species data to be used in the comparisons all come from the tall, wet eucalypt forests of southern Tasmania. It might legitimately be asked whether a definition of seasonality used in north-eastern Tasmania is relevant for examining questions about the seasonal emergence of macrofungi in the southern forests. The Forest Practices Authority of Tasmania has divided Tasmania into eight bioregions, with most of north-eastern Tasmania included in the Ben Lomond Region. The forests occurring in that region comprise several broad forest types, including rainforest, wet eucalypt forest, dry sclerophyll forest and woodland, mixed forest (eucalypt forest with rainforest species also prominent), swamp forests, and other forest scrub (Forest Practices Authority 2005). Therefore, virtually all Tasmanian forest types occur in the northeast, so that a definition of seasonality that applies there may have state-wide relevance.

The main question to be addressed in this paper relates to whether the indigenous concept of season correlates better with overall macrofungal fruit body emergence in the cool, wet forests of southern Tasmania than that based on the European-based seasonal calendar. In addition to overall macrofungal richness, questions about whether individual substrates, e.g. wood, soil and litter, have different seasonal requirements are also addressed.

Materials and methods

Surveys

Sites and plots:

Examples shown here are from three surveys conducted at the Warra long-term ecological research (LTER) site in southern Tasmania. The "First Warra survey" (Gates *et al.* 2005) compared the macrofungi that emerged after the application of a silvicultural regeneration treatment known as "clearfell, burn and sow", abbreviated CBS, with the macrofungi in a nearby, unharvested control plot of a similar forest type. In total, 27 visits were made at approximately fortnightly intervals between 12 June 2003 and 29 June 2004 to each plot. As the CBS coupe was burnt and sown in April 2001, the survey was conducted 26-38 months after site preparation. The "Second Warra survey" (Gates *et al.* 2009) recorded the macrofungi that emerged between 10-26 months after being subjected to the silvicultural treatment known as aggregated retention, where a coupe is only partially harvested, the harvested portions then receiving a low intensity burn. The macrofungal species assemblages and species richness from this coupe were compared to those in a nearby, unharvested control plot of a similar forest type, which was part of the same control plot that was employed in the First Warra survey. This time a shorter transect was used and the date of the survey was approximately two years later. In total, 35 visits were made between 8 February 2005 and 16 June 2006 after site preparation was completed on 20 April 2004. The "Third Warra survey" was conducted in an area known as the "Bird Track", a portion of the Warra LTER site with substantially different stand characteristics from the plots in which the first two surveys were conducted. Although the forest type of all three surveys is wet sclerophyll dominated by *Eucalyptus obliqua* L'Hér., the plots of the first two surveys had an understorey lacking all rainforest elements such as *Nothofagus cunninghamii* (Hook.) Oerst. and *Atherosperma moschatum* Labill. In contrast, in the third survey, the rainforest species *Nothofagus cunninghamii* and *Atherosperma moschatum* were present in all four of the individual plots of this chronosequence study, with the "youngest" plot having had its most recent wildfire 72 years previously. Some of the sampling details in that tall, wet eucalypt forest of differing ages since the last wildfire were described in Ratkowsky & Gates (2008), with a complete description of the individual plots given in Gates (2009). For this paper, the 0.25 ha individual plots were combined, so that the macrofungal information is from a total area of 1 ha, where 30 visits were made to the combined area at approximately fortnightly intervals between 25 April 2006 and 3 July 2007.

Time spans:

Not only were the three surveys conducted at different real times (in terms of calendar dates in different years), they were also carried out for different lengths of time, all of them for longer than a 12-month period, thereby doubling up on some seasons, at least in part. Therefore, for this paper, the records for each survey were restricted to a 12-month period to avoid a bias to any season in any survey. The details are as follows:

First Warra survey: 1 July 2003 – 30 June 2004, 25 visits, approximately fortnightly.
Second Warra survey: 1 June 2005 – 31 May 2006, 24 visits, approximately fortnightly.
Third Warra survey: 1 June 2006 – 31 May 2007, 25 visits, approximately fortnightly.

In addition, the opportunity was taken to examine the macrofungi that emerged after a wildfire that occurred on 1 April 2005 at the junction of Bennetts and Arve Roads, located ca. 13 km from the silvicultural systems trials. The wildfire completely burnt the understorey and destroyed the canopy of all the standing trees. Twenty-four visits were made during 1 June 2005 – 31 May 2006, i.e. 2–14 months since the wildfire disturbance, on the same days that visits were made to the plots of the Second Warra survey.

Results

First Warra survey

Results for the first Warra survey are given in Table 1 for each of the plots separately. The number of records and the number of species in each plot is shown, along with the percentages that occurred in each season, both indigenous and European-based. Although the percentages add up to 100% for records, the sum exceeds 100% for species, as some species occurred in more than one season. For the indigenous seasons, Tunna was by far the richest for the CBS plot, with Wegtellanyta second richest. There was virtually no difference between these two seasons for the unharvested control

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Table 1. First Warra survey, showing the number of macrofungal records and the number of species in each plot, and the percentages of the total number of records or species recorded in each season. Note that the row percentages add up to 100% for records, but not for species, as some species were recorded in more than one season. The abbreviation CON refers to the unharvested control plot and CBS refers to the “clearfell, burn and sow” silvicultural treatment.

Indigenous seasons		Percentage of total (records or species)		
Plot	No. of records or species	Wegtellanyta (Dec–Apr)	Tunna (May–Aug)	Pawenyapeena (Sep–Nov)
CON	779 records	42.7	43.4	13.9
	232 species	63.4	62.9	28.4
CBS	492 records	24.0	61.0	15.0
	127 species	44.9	85.0	32.3

European seasons		Percentage of total (records or species)			
Plot	No. of records or species	Summer (Dec–Feb)	Autumn (Mar–May)	Winter (Jun–Aug)	Spring (Sep–Nov)
CON	779 records	12.6	42.9	30.7	13.9
	232 species	30.6	62.9	49.1	28.4
CBS	492 records	7.1	34.3	43.5	15.0
	127 species	16.5	65.4	69.3	32.3

plot CON. For the European-based seasons, winter was richest for the CBS plot, and autumn was the richest for CON. Results are also shown in graphical form in Fig. 1, where species richness, measured by the number of macrofungal species observed during each month, is graphed against month using a clustered column bar graph to show both plots in the same month. The regenerating plot CBS had its highest numbers in May and June, but for the control plot CON, high richness was manifest broadly throughout the five month period March–July.

Second Warra survey

Results for the Second Warra survey are given in Table 2 for each plot or component of a plot separately, the aggregated retention plot being divided into the aggregates (labelled AGG) and the harvested areas

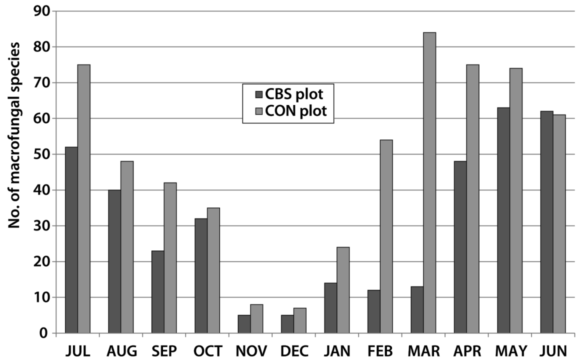

Fig. 1 First Warra survey, macrofungal species richness on a monthly basis, for the CBS and CON plots.

Table 2. Second Warra survey, showing the number of macrofungal records and the number of species in each plot or component, and the percentages of the total number of records or species recorded in each season. Note that the row percentages add up to 100% for records, but not for species, as some species were recorded in more than one season. The abbreviation CON refers to the unharvested control plot; AGG refers to the unharvested portion (i.e., aggregates) of the aggregated retention silvicultural treatment; HAR refers to its harvested portion. WLF refers to an area affected by a wildfire at Bennetts and Arve Roads.

Indigenous seasons		Percentage of total (records or species)		
Plot or component	No. of records or species	Wegtellanyta (Dec–Apr)	Tunna (May–Aug)	Pawenyapeena (Sep–Nov)
CON	555 records	31.4	50.6	18.0
	207 species	45.9	63.8	27.1
AGG	350 records	23.4	62.6	14.0
	142 species	38.7	76.1	22.5
HAR	385 records	20.5	62.1	17.4
	114 species	36.0	84.2	28.1
WLF	228 records	40.8	31.6	27.6
	59 species	55.9	66.1	42.4

European seasons		Percentage of total (records or species)			
Plot or component	No. of records or species	Summer (Dec–Feb)	Autumn (Mar–May)	Winter (Jun–Aug)	Spring (Sep–Nov)
CON	555 records	13.3	38.0	30.6	18.0
	207 species	22.2	59.9	44.4	27.1
AGG	350 records	10.3	34.6	41.1	14.0
	142 species	19.0	57.0	54.2	22.5
HAR	385 records	7.3	33.2	42.1	17.4
	114 species	15.8	63.2	71.1	28.1
WLF	228 records	22.4	34.6	15.4	27.6
	59 species	35.6	67.8	27.1	42.4

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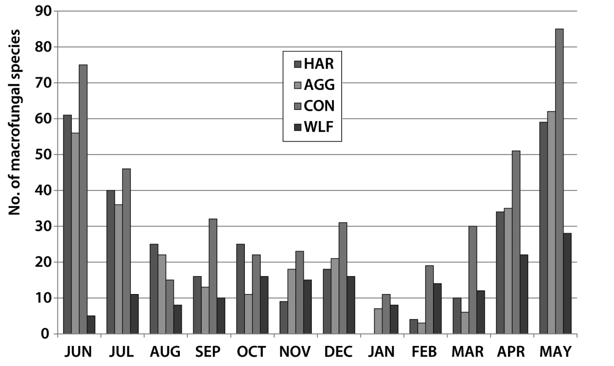

Fig. 2 Second Warra survey, macrofungal species richness on a monthly basis, for the two components (HAR and AGG) of the aggregated retention plot, the control plot CON, and the wildfire affected area at Bennetts and Arve Roads (WLF).

(labelled HAR). The total number of records and the total number of species in each plot or component is shown, as well as the percentages that occurred in each season. Also included in Table 2 are the results from the survey of a plot (labelled WLF) at Bennetts and Arve Roads that had experienced a wildfire and was surveyed on the same days as the aggregated retention study. For the indigenous seasons, Tunna was the most species rich for all four plots or components, with Wegtellanyta being second. For the European-based seasons, autumn was the richest for three of the four plots, but winter, with 71.1% of the species, was the richest season for the harvested plot HAR. Results are also shown in graphical form in Fig. 2, where species richness is graphed against month using a clustered column bar graph to show all the plots or plot components in the same month. For the regenerating harvested areas (HAR), highest species numbers were obtained in the months of May and June, as was also the case for the neighbouring aggregates and the control plot. For the regenerating area after wildfire (WLF), May had the highest richness, with only four species of macrofungi recorded in June of the previous year, less than three months after the wildfire.

Third Warra survey

Results for the Third Warra survey are given in Table 3, with the focus being on the substrate on which the macrofungal species occurred, rather than upon the plot in which the species was found. The three major substrates are wood, soil and litter, with wood divided into two component parts, coarse woody debris (CWD), defined as dead wood of diameter at least 10 cm and length at least 1 m, and other dead wood (ODW), defined as all fallen wood not meeting the definition of CWD. Two other wood components, viz. stags and living wood, made up less than 1000 records and are omitted from Table 3. The last row in the table gives the results for all substrates combined. Using the indigenous definitions, Tunna was the richest season for all substrates, with Wegtellanyta being the second richest. Using the European-based definitions, winter was the richest season for all substrates, with autumn second.

For the Third Warra survey, the dominant families of macrofungi were substrate dependent, as shown in Figs 3–5, which list the major families in decreasing order of

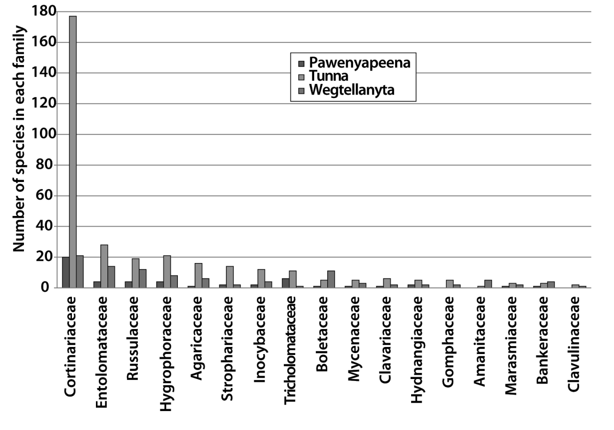

Fig. 3 Most frequently occurring families of macrofungi on soil, listed in decreasing order of species numbers.

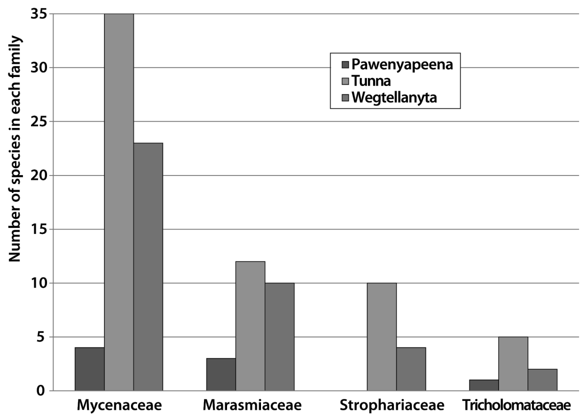

Fig. 4 Most frequently occurring families of macrofungi on litter, listed in decreasing order of species numbers.

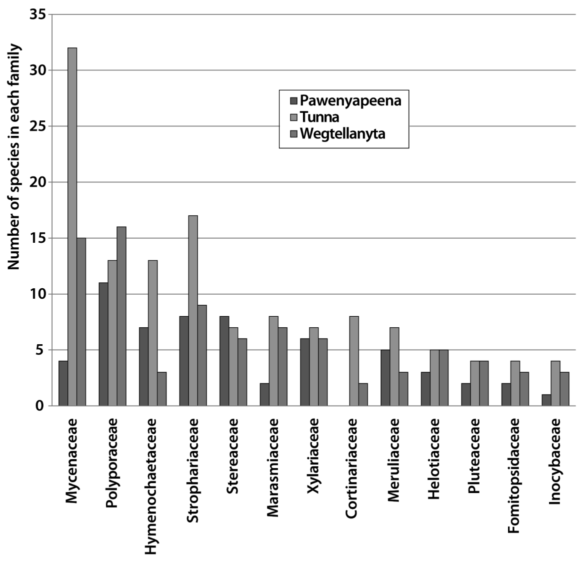

Fig. 5 Most frequently occurring families of macrofungi on wood, listed in decreasing order of species numbers.

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Table 3 Third Warra survey, showing the number of macrofungal records and the number of species recorded on each substrate, and the percentages of the total number of records or species recorded in each season. Note that the row percentages add up to 100% for records, but not for species, as some species were recorded in more than one season. The substrate "Wood" is subdivided, showing results for coarse woody debris (CWD) and other dead wood (ODW). "Total" is the sum of the categories Wood, Soil and Litter.

Indigenous seasons		Percentage of total (records or species)		
Substrate	No. of records or species	Wegtellanyta (Dec–Apr)	Tunna (May–Aug)	Pawenyapeena (Sep–Nov)
Wood	5077 records	21.9	68.0	10.1
	351 species	43.0	79.5	31.1
CWD	2503 records	19.5	71.2	9.3
	248 species	41.9	85.5	25.0
ODW	1937 records	22.1	67.2	10.7
	211 species	48.8	72.5	37.0
Soil	3416 records	12.1	81.6	6.3
	397 species	26.4	88.4	14.6
Litter	1884 records	27.9	71.0	1.1
	114 species	44.7	82.5	9.6
Total	10377 records	19.8	73.0	7.2
	723 species	35.8	85.2	23.8

European seasons		Percentage of total (records or species)			
Substrate	No. of records or species	Summer (Dec–Feb)	Autumn (Mar–May)	Winter (Jun–Aug)	Spring (Sep–Nov)
Wood	5077 records	7.7	35.8	46.4	10.1
	351 species	26.2	46.2	70.4	31.1
CWD	2503 records	5.4	37.8	47.5	9.3
	248 species	18.5	54.0	72.2	25.0
ODW	1937 records	8.3	35.2	45.8	10.7
	211 species	33.2	46.4	62.6	37.0
Soil	3416 records	3.2	39.4	51.0	6.3
	397 species	11.6	57.4	68.0	14.6
Litter	1884 records	2.3	65.8	30.8	1.1
	114 species	7.9	63.2	65.8	9.6
Total	10377 records	5.3	42.5	45.1	7.2
	723 species	18.4	52.4	71.8	23.8

species richness (i.e., number of species in each family) that occurred on soil, litter, and wood, respectively.

Discussion

The results presented here indicate that the indigenous season Tunna matches up fairly closely with the period of maximal macrofungal appearance, as species richness ranged between 62.9 and 88.4% in that season (Tables 1–3). Overall, the data clearly support the notion that the fungal fruiting season in the wet forests of southern Tasmania fits within the indigenous seasons concept better than within the European seasons concept. Nevertheless, this could be seen as irrelevant if the main interest is in planning fungal surveys in this region and one desires a narrower "window of time" for surveying than the four months' period that defines Tunna. Figs 1–2 provide information on a monthly basis, leading to the conclusion that, for plots such as CBS and HAR, which are in early stages of regeneration, the months May and June are the best times to survey. The conclusion is less clear for the unharvested plots (CON and AGG). For the First Warra survey, the macrofungal species richness in May and June for CON was less than that in the preceding months March and April, but the whole of the five month period March–July (if July of the previous year is included here) had high species numbers. Two years later, May and June proved to be richer months for CON and AGG than any other month, as was also the case for the harvested areas HAR. Thus, the results suggest that narrowing the survey window to May and June may be the "best bet", in the absence of further information. Nevertheless, the fact that May and June were outperformed by the preceding two months in the control plot in 2005 suggests that there are other factors involved, one of which will be discussed in the next paragraph.

The harvested plot (CBS) or harvested areas (HAR) produced a majority of the records (61% and 62.1%, respectively) and the bulk of the macrofungal species (85% and 84.2%, resp.) during the indigenous season Tunna. Both CBS and HAR are similar in that they are in early stages of regeneration, being open environments without the shelter provided by a closed canopy. A regenerating plot is more exposed than a mature plot, experiencing frost and more extremes of temperature and lacking the vegetation that helps maintain moisture. Higher rainfall and cooler temperatures may be needed to initiate macrofungal fruit body production, a situation typically associated with late autumn and during winter, these being the months that define the indigenous season Tunna (i.e., May–August). This is in contrast to their corresponding unharvested controls (CON), which had a much lower species richness in Tunna (62.9 and 63.8%, respectively). Unlike a regenerating plot, a mature plot such as CON has a closed canopy that protects against frost and temperature extremes, and contains more

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abundant vegetation for maintaining moisture in the plot. Macrofungal fruiting may therefore occur over a broader window of time than in a harvested area, and this may explain, at least in part, why CON produced high species richness over a five month period in the First Warra survey.

Results on the substrates soil and litter from the Third Warra survey are worthy of mention. For soil, there was an exceptionally high percentage of records in Tunna (81.6%) and an exceptionally high percentage of species (88.4%). This was due largely to the dominance of the family Cortinariaceae, 177 species of which emerged in Tunna (see Fig. 3), the majority of them being unnamed. For litter, the noteworthy observation is not the particularly high occurrence of either records or species in Tunna (although 82.5% of the species did occur in that season) but the fact that the vast majority of the records (>96%) occurred within the six-month time span corresponding to the combined European-based seasons of autumn and winter. Outside this seasonal band, only a small proportion of litter fungi appeared again before the following calendar year. Hering (1982) suggests that as fruit bodies of litter fungi are usually small and form primordia at relatively shallow depths, moisture fluctuations have more effect on litter fungi than on other groups of macrofungi. The required spatial domain is very small and the leaf petiole or blade or a very fine twig can support many species and many fruit bodies. Such small pieces of substrate are quickly wetted and dried out again even during a short period of 24 hours. As can be seen from Fig. 4, the predominant families on litter are Mycenaceae and Marasmiaceae, the species of which can be supported by a small amount of substrate. In contrast, these two families are minor ones on soil, which can accommodate the larger species that are found, for example, in the families Cortinariaceae, Russulaceae, Agaricaceae, Strophariaceae and Tricholomataceae (see Fig. 3).

For wood, the results in Table 3 show that, overall, 31.1% of the total number of species were recorded during the season Pawenyapeena (identical with the European-based season spring), compared with only 9.6% and 14.6% on litter and soil, respectively, for that season. This can be explained by the fact that wood, especially large fallen wood in close contact with the ground, can act as a moisture reservoir (Amaranthus *et al*. 1989). The better retention of moisture by wood compared to soil or litter during a prolonged dry period such as is often experienced in spring enables fruit body formation to occur even after fruiting has ceased on those other substrates. This explanation is also supported by the higher numbers of species on wood in the European-based summer than on the other substrates in that season. Wood also has a more even distribution of species numbers by family than soil and litter (cf. Fig. 5 with Figs. 3–4), there being no single dominating family for species richness.

The interpretation of the results for the wildfire-affected plot WLF is relatively straightforward. As the wildfire occurred on 1 April 2005, all the records for Wegtellanyta or for the European-based summer (Table 2) were obtained at least 8 months after the fire, during which time extensive coppicing of the burnt eucalypts had occurred, litter had formed once again, and a protective canopy covering had developed, all of which helped retain moisture in the plot. The start of Tunna in 2006 occurred 13 months after the wildfire, a sufficiently long time to enable the richness that is associated with that season in all plots to be manifest. The trend is clearly seen in Fig. 2, despite the inevitable lower species numbers in the summer months.

The essence of the weather knowledge possessed by the indigenous population was their exceptional observational skills attuned to their environment. They were aware of fungi as food, knowing which ones were edible and which were poisonous (Kalotas 1996), and they would have noted the onset of a macrofungal fruiting season in combination with the other biotic and climatic factors that contributed to the seasonal divisions in their unwritten seasonal calendars. The absence of fixed dates defining the seasons would have enabled them to time the break between the dry summer season and the wetter autumn season in a flexible manner, and thereby take account of the important overshadowing factor of year-to-year variability. For planning fungal surveys in this region, the survey technique should take account of the rainfall and temperature records in the months preceding the proposed study. For example, in a year in which the autumn rains and cooler temperatures come early (i.e., in March), species richness might be higher in Wegtellanyta and correspondingly lower in Tunna than was observed in the studies reported here. Phenological studies in the Northern Hemisphere agree that rainfall and temperature affect fruiting patterns of macrofungi (Wilkins & Harris 1946, Hering 1966, Salerni *et al*. 2002) and similarly in Australia (Johnson 1994, Burns & Conran 1997, Robinson 2001, Newbound 2008). Janík & Mihál (2007) found that the production of macrofungi was more influenced by the total precipitation than by soil temperature. It is generally agreed that before fruiting, most macrofungi require a period of vegetative growth (e.g., Lange 1984, Salerni *et al*. 2002) in which the mycelia accumulates before being triggered to fruit. The lag time between the onset of favourable fruiting conditions and fruit body production differs for different species of macrofungi, as has been determined from laboratory culturing of species (Lange 1984). All of these factors add to the difficulties involved in finding an infallible window of time for fruit body emergence.

It is of interest that Simpson (1997) has expressed the view that the teaching of meteorology in schools attended by Aboriginal children may be seen to be grossly inadequate if non-Aboriginal teachers continue to define the seasons as summer, winter, autumn and spring to children "whose parents have a much better knowledge of the weather of their region". She also noted the danger of being condescending, even if unintentionally so, about aspects of the Aboriginal people's belief system relevant to meteorology, defining the challenge for teachers in the wider community as being to present Western science's advances in understanding the causes of weather, while showing respect for the ethnometeorology of the original inhabitants of the Australian continent.

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Conclusions

1 For planning macrofungal surveys involving overseas visitors who may need to apply for funding and/or make travel arrangements long in advance, the results obtained here suggest that the season to consider is the indigenous season Tunna, which coincides with the period of greatest macrofungal species richness in the tall wet eucalypt forests of southern Tasmania, irrespective of whether the substrate is wood, soil or litter. The months May and June offer the best possibilities.
2 Where decisions about survey times can be made spontaneously, available information on the weather during the preceding months, particularly the rainfall records, should be used in planning. In years where there is an early break between the dry summer and wet autumn seasons, moving the survey time forward to March or April should be considered.
3 Residents of Tasmania can assist their short-term planning of forays by incorporating recent observations of biotic factors, viz. fruit maturity, bird migrations and the activity of other animals, thereby mimicking the observational skills of the earlier indigenous populations.
4 For habitats regenerating after silvicultural treatment, where the plot is exposed and there is an absence of a closed canopy, a later time to survey (May and June) was found to be best.
5 For unharvested control plots, earlier survey times (March and April) might be acceptable, although the later months of May and June may be as good or better.
6 Seasonal differences are least marked when the substrate is wood, which can act as a moisture reservoir.

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