Star-rhythm in mistletoe shape

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The mistletoe lambda-value analysis by Baumgartner and Flückiger published in your Journal (1) is of interest (I read the English translation published in *Archetype* (2)). The authors detected a sidereal-element Moon-rhythm in a berry, instead of the fortnightly lunar-month rhythms that had normally been found in buds, using the same lambda-value maths (changing bud shape) developed by Lawrence Edwards (3). The Moon-rhythm they found was therefore of 9.1 day periodicity (27.3 / 3 days), not the 14 – 15 day periodicities hitherto reported (4).

While they displayed their results by the twelve unequal constellation-divisions along the lunar ecliptic path (the horizontal line along the middle of their graph shows where they reckon these boundaries should be), I would advocate use of a best-fit third-harmonic waveform over 120° of sidereal space as a more scientific approach. The authors were not prepared to part with their data but allowed me a high-resolution graph (5), inviting me to extract lunar longitudes and mean deviations of their lambda values there from. I did this (using the 'Autograph' math package to read off the co-ordinates) and have used these; an error of a degree or so is likely as resulting from my data extraction.

One is startled that they were not able to find any physical or environmental factor which correlated with the berry shape of mistletoe, eg rainfall or humidity. This may have been because of the nearly circular shape of the fruits, whereby the lambda-value hovered around unity: ambient moisture would have expanded or contracted the berries, without altering their lambda-value (the 'path-curve' shape). It might be worth the authors clarifying this point, as to whether the berry size varied with atmospheric moisture and rainfall, whereas their shape (lambda-value) did not.

Data-Transformation

The two authors trend-corrected each data set from the three years 1995, 1997 & 1998 using linear regression lines. That made the data zero-sum, i.e. varying about a mean, (They called this the λ data) and that enabled them to combine the three years' data. For their second paper they somehow acquired 1991 data, as well as more from 2000 and 2001.
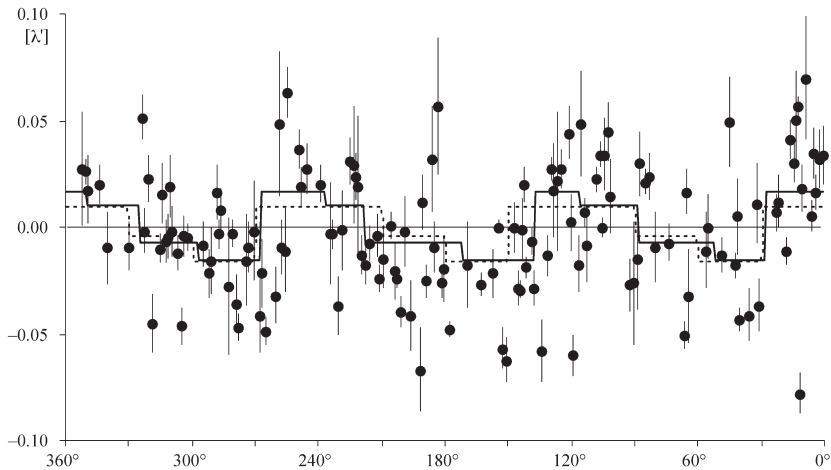
Fig 1: Figure 7 from the Authors' 2003 paper. Total (139) trend-corrected λ-values from mistletoe
berries over six years, plotted by (tropical) lunar longitude at measuring-time, and showing the 12
unequal-constellation boundaries used by the authors.

Using a 3rd-Harmonic Waveform

Using these 139 combined λ' data points, I plotted them by lunar zodiac longitude
at time of measurement, using the star-zodiac (6). But, the plot only extended
to 120°, i.e. through four zodiac signs, so that longitudes of 130° or 250° from
zero Aries would count as 10°.

The waveform present in this transformed data is shown in Figure 2. Such
a 120° 'third harmonic' waveform can only be plotted, if one assumes that the
sidereal zodiac elements are divided in a twelvefold manner (by the 'trigons') *at
equal 30° intervals.*

The data indicated that the Four Elements – or, four ethers – work into berry
(not bud) morphology. The plot shows a sort of Thun-type 'sidereal element' effect,
but spread over both Air and Water ('flower-days' and 'leaf-days'). I've subtracted
25° from their given Moon-zodiac longitudes (i.e., normal 'tropical' longitudes,
as calculated by the Authors) to give sidereal-zodiac longitudes: that being the
generally-agreed current 'ayanamsa' or phase-difference between tropical and
sidereal zodiacs.

A 3rd-harmonic waveform will have the equation, $\lambda = \alpha \sin 3(l - \beta)$ where α
is the *amplitude* of the effect, and the number '3' pertains to the *wavelength* or
frequency, meaning that the waveform will go through three cycles per sidereal
lunar month, measured 0 - 120°. 'β' gives the *phase* of the waveform, eg this is
where you have to put in the 25° which shifts from tropical (the lunar longitude
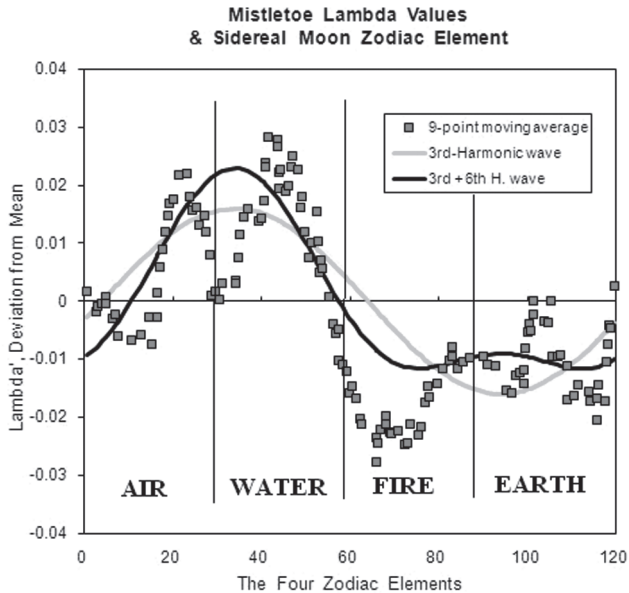
Fig 2: Two best-fit waveforms put through six years of trend-corrected mistletoe lambda-values, taken data directly from fig 1, with lunar celestial longitude using the star-zodiac.

which will be given, from the computer or ephemeris, for a given date and time) to sidereal. The variable in this equation is 'l,' the lunar zodiac longitude in radians (for degrees, factor in π/180, as in the equation below) . The equation gives us the expected lambda-value.

The waveforms are a 'best-fit' against the 139 data-points: that is to say, their parameters of amplitude and phase were adjusted to minimise the sum of the squares of the vertical y-distances between the sinewave and the data-points.

I have put in an extra waveform at half the wavelength (i.e., a 6th-harmonic) as an optional extra. It has the same peak in celestial longitude as the primary third-harmonic waveform:

$$\lambda = 0.016\sin(3(l - 4)\pi/180) + 0.007 \sin(6(l-19) \pi/180)$$

As well as these two sinewaves, I have plotted a moving average (13-point) through all the given lambda-values. The actual data points (shown in Fig 1) would have a much larger scatter.

Amplitude of the Effect

How big is the effect? The authors claim that a 4% difference in lambda-values may be found between two halves of the data. The graph function shows peak amplitude in the lambda function of 0.023, which we may express as ± 2.3%,

and this tends to confirm the Authors' view. (7) Or, from inspection of Figure 2, one can generally confirm the Authors' view of the amplitude of the effect which they discovered.

This is a slightly larger fluctuation than Lawrence Edwards found for his fortnightly bud-rhythms. I found amplitudes of 1.3% and 1.8% lambda in cherry bud rhythm and beech bud rhythm (4). Permit me here to suggest, that the wave-harmonic approach I am here advocating, gives a more straightforward means of describing the amplitude of the effect.

Significance level

The 1995 data-set was the one which the Authors used to formulate their hypothesis, namely that λ-values increased for Moon in Air and Water signs and decreased for Fire and Earth signs. That year of data therefore needs to be excluded from any statistical test. I cannot see that they did this. Using Figure 2, their hypothesis would compare the data spread over 0-60° with that spread over 60 -120°. I suggest that this approach is both a lot simpler, but also a more scientific and credible approach: no statistician is ever going to like grouping the data by twelve irregular constellation-divisions! I am not able to subtract out the 1995 data, but if it is of any interest, here is what a t-test gave:

Six years of Mistletoe lambda-data divided by lunar-zodiac element
Air & Water: 9.4 ± 29, (n=73),   Fire & Earth   = - 14.4 ± 25 (n=64),
 t = 5.1
(scaling up λ by 1000 to remove decimals) That t-value corresponds to around one in ten thousand. It would be a bit lower if we subtracted out the 1995 data. That is a remarkably high value. (8)

A Sharp Boundary

Getting a decent significance level in biological data is notoriously difficult. So the Authors are to be congratulated in achieving this. That high level of significance is related to the very sharp boundary evident in Figure 2, at the 60° threshold where Fire/Earth changes over into Air/Water. The moving-average shows a sharper 'boundary' than the sinewave: if a further set of data were to confirm that, then one could add on one (or more) extra waveforms to model the sharper boundary. Such a sharp boundary at 60° tends to confirm that an equal-interval zodiac is here operating, as such a dramatic effect could hardly be shown with unequal constellations.

Relevance to Healing

The theory at stake here is intriguing, that mistletoe, as a plant with no roots in the Earth, is more 'astral' than it is 'etheric' in its life-energy, and so is attuned to a

star-rhythm rather than the more normal 14-day tidal rhythm. This data therefore deserves careful analysis.

It could be of relevance, that the Water and Air elements are 'positive,' in the discovery here made by the two Authors; as indicating the balanced, etheric energies required for healing cancer, as applied in the Hiscia Klinic.

The Authors have made a contribution towards what Lili Kolisko called 'The Working of the Stars in Earthly substance', the first step of which was taken by Maria Thun in 1956. Their finding also provides indirect support for the 'Thun effect' used in Bio-dynamic calendars.

A Duality?

Some might wish to take the view that the discrete-boundary approach (of unequal constellations) and the wave-harmonic approach here advocated are compatible, and are two different approaches to the subject, maybe like the wave/particle duality of modern physics.

Regrettably, the 2003 paper by the Authors utilised the tired, old duality - which has done so much to impede Bio-dynamic research – between the tropical zodiac of astrologers and the unequal-sign constellations, 13 of which exist around the ecliptic according to the modern astronomical boundaries. Fortunately, a bio-dynamic textbook has now emerged, *Cosmos, Earth and Nutrition* (9), which advocates (based somewhat on my research (10)) the ancient star-zodiac, as the proper and efficacious framework for studying time-patterns of sidereal influence upon plant growth.

References

1. *Baumgartner Stephan, Flückiger Heidi* (2002): Formveränderung reifender Mistelbeeren. Elemente der N. 77, pp. 2–15. This was followed by their 2003 article Baumgartner Stephan, Flückiger Heidi and Ramm Hartmut (2003): Formveränderung reifender Mistelbeeren. Elemente der N. 79, pp.2–21.
2. *English translations: Baumgartner et. al.*: Shape changes of ripening mistletoe berries. Archetype No. 9 (Science Group of the anthroposophical Society in Great Britain, Ed. David Heaf), September 2003; followed by: *Baumgartner et al.*: Mistletoe berry shapes and the zodiac,' Archetype No. 10, September 2004. (This journal is now defunct.)
3. *Edwards, Lawrence* (1993): The Vortex of Life: Nature's Patterns in Space and Time. Edinburgh.
4. *Kollerstrom, Nicholas*: The fortnightly tree bud rhythms of Lawrence Edwards. *Archetype* No. 11 (September 2005). The fortnightly cherry bud rhythm I found to have half of 29.6 days, the synodic period (His cherry lambda-data was made daily over Nov. 10, 1983–March 4 1984, without a break: it had peaks in step with Moon-Venus conjunctions and oppositions), while the beech-bud rhythm I found to oscillate at half of 27.0, closer to the lunar sidereal month (using his 'Dornach beech' Oct 14 – Dec 26 1994, possibly in step with Moon-Saturn conjunctions and oppositions).
5. Stephan Baumgartner kindly sent me this diagram (Fig 7, 2003, here Fig 1).
6. *Powell, Robert* (2007): The History of the Zodiac. Sophia Academic Press, CA. My work is alluded to on pp 7 & 81–82. Powell's The Astrological Revolution (Lindisfarne

books, 2010) has an Appendix 4 'Planting by the Moon,' which gives my argument for an equal-interval zodiac framework for use with growing crops.

7. This graph may be compared with that of the Authors in their 2002 article, Figure 4a.

8. The Authors may detract from their argument by citing a one in a million level of significance (2002, 2003 in Archetype, p.11). It is in the nature of a significance test, that there is only one correct method of doing it.

9. *Smith, Richard Thornton* (2009): Cosmos, Earth and Nutrition, The Biodynamic Approach to Agriculture. Sophia Books: pp.150–151 for preferred use of equal-interval zodiac.

10. http://www.biodynamic.org.uk/fileadmin/user_upload/Documents/Evidence_for_ Lunar_Sideral__Rhythms_in_Crop_Yield_An_overview.pdf

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