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Serious Research with Great Fun: the Strange Case of Jan Šuspa Lepš (and Other Plant Ecologists)

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Introduction

Trade-offs between organismal traits are among the strongest constraints on life strategies for most species and individuals (MacArthur and Wilson 1967; Grime 2006). The balance between offspring quantity and quality is a classic example found in many organisms. In humans, these trade-offs can be complex. For example, an individual either has muscles to run fast, but for a short period of time, or (s)he is able to run for longer at a slower pace, exhibiting one of two alternative strategies to escape predators. This basically implies that famous heroes such as Superman or Homer Simpson (i.e. with strategies corresponding to "never" *vs* "always" being caught by predators) are actually quite difficult to find in nature.

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A Serious Trade-off: Drinking vs *Publishing*

Trade-offs are claimed to control the behaviour of specific populations of human individuals, including researchers and, particularly, ecologists. One important trade-off for the life strategy of an ecologist seems to be the negative correlation between drinking and scientific output (e.g. publication or citation rate), as detected for Czech animal ecologists by Grim (2008). Because this study was published in the prestigious journal *Oikos*, we believe it constitutes a serious suggestion of an important trade-off, which should leave little space for the existence of researchers able to do serious science and have plenty of fun at the same time. While we do not believe that having fun is measurable in terms of the amount of alcohol consumed, at least not linearly, we recognize that many people of different backgrounds do enjoy an evening over a few beers. In general, we believe that while sharing a drink or two, people tend to interact and build up social networks, even scientific ones, which could, imaginably, even encourage the publication activity. It is therefore quite possible that the linear negative relationship between drinking and publishing could be less general than hypothesized by Grim (2008). The relationship might even be unimodal, with increased creative output under moderate consumption of alcohol (Moyna-Larano 2008; Jarosz et al. 2012) followed by a sharp decrease as consumption reaches excessive levels. Drinking could also be a consequence of difficulties with getting a paper published, not the other way around. The purported negative relationship between drinking and publishing might even not apply equally to all fields of ecology. It could vary for different classes of researchers. As we argue below, this relationship could be particularly different for plant ecologists. We also argue that the relationship found by Grim can be disrupted in cases of scientists possessing a very specific combination of traits, including opposing ones.

We reason that, considering plants are sessile, plant ecologists can easily drink a couple of beers while sampling without running the risk of scaring their study organisms or having difficulties to quickly pursue the fleeing subjects of their research. As such, data collection after some beers is possibly less constrained in plant ecology than in animal ecology. This could produce higher volumes of data, possibly implying higher scientific outputs. Another reason for the possible disruption of strong trade-offs in ecologist behaviour is the existence of a very special set of individual traits. Exceptions to evolutionary trade-offs are generally selected against by strong natural selection. In some cases, however, a special set of diverse life history traits might help certain individuals, and populations, avoid such selective forces and still prosper in their environment.

Exceptions to strong evolutionary trait trade-offs described here mostly refer to cases that show an almost unimaginable combination of traits. Here we claim that individuals overcoming these trait trade-offs do exist – as exemplified by the person of Prof. Jan "Šuspa" Lepš. He combines skills in several scientific disciplines and, at the same time, is known to spend a non-negligible proportion of his time having fun consuming beer (or wine) with friends and playing music. In the following text, we first describe the rare traits of this extraordinary biological specimen. We then attempt to delineate how these traits have contributed to the vast and colourful life history of this individual. In addition, we postulate the question whether the combination of traits indisputably characterizing our model specimen could also be found among his

pupils and fellow plant ecologists. In other words, are the defining life-history traits of the model specimen more generally shared among members of the cohort (in this case, scholars in the field of plant ecology). We specifically focus on the relationship between indices of scientific excellence and social activities, which are believed to hinder the achievement of such excellence. Our general aim is to enable plant ecology students to orientate themselves in the choice of life priorities.

A Peculiar Combination of Traits

Jan Šuspa Lepš (hereafter referred to as "Šuspa") possesses a number of special traits that make him rather unique. Interestingly, many of these traits form pairs of contrasting attributes; here we analyze these combinations of opposing traits. Above all, Šuspa is well known to be a serious plant ecologist (see next section) who does not take life so seriously. He is indeed a notorious workaholic who is always "on the run" (not from police, as far as we are aware!) with days filled with an astonishing amount of tasks. Incredibly, at the same time, he always finds time for carefully attending to students and colleagues as well as for engaging in numerous outside-of-work activities. These include various musical, sophisticatedly cacophonic recreational events (www.sukas.cz, not to be confused with www.sukas.com), in which he participates by playing various instruments (especially if the songs are in C major). Šuspa has also acquired the love for saunas and ice dipping, backpacking trips into the wild, skiing, skating, diving, etc. etc. Moreover, although when speaking with friends, colleagues and students in intimacy, Šuspa uses very gentle and soft voice tones, in all public events his legendary shouting can clearly be heard across multiple floors, buildings and even quarters.

Further scrutiny reveals even more multiform and interesting traits that create this unique assemblage of contrasting attributes. Witnesses courageous enough to enter his nest (i.e. Šuspa's office) attest that a high level of entropy and chaos can actually coexist with peaceful and productive environmental conditions. Maybe this is the reason why one of Šuspa's favourite index of diversity is quadratic entropy (Lepš et al. 2006). Although losing / forgetting objects is a constant in Šuspa's daily life, one is always positively surprised by the amount of work produced and events organized by the specimen. As a matter of fact, besides being head of the Department of Botany at the University of South Bohemia, Šuspa also contributed (considerably) to the establishment of the University itself! For this reason, Šuspa enjoys a high level of respect and admiration from students, colleagues and, in fact, all people interacting with him.

The specimen considered here also exhibits a rather unique combination of scientific abilities that are rarely found in a single researcher. While he has a very strong mathematical background with extensive modelling and theoretical skills, he is also a deeply rooted field biologist with a vast knowledge of the taxonomy and ecology of species from different trophic levels (see below) and biomes of the World. Furthermore, he devotes a great deal of his time to carrying out passionate ecological research and to helping others to do the same. Last but not least, Šuspa is endowed with a sharp intelligence and a wide breadth of knowledge, yet he is one of the most accessible, attentive and humble people that students and researchers have the luck to interact with. Since many of these traits are so antithetical, we consider it appropriate to label Šuspa "strange case", albeit not as strange as the case described by Stevenson

(1886), as far as we are aware. We claim here that opposite traits, when acting simultaneously, can help maintain sustainable populations of individuals, including ecologists.

Trait Combination Effects on Life History

We believe this strange combination of traits has helped Šuspa establish a wide network of positive biotic interactions within and across trophic levels. These positive interactions with more than 200 co-authors have led to the production of over 100 published papers, altogether cited more than 2,000 times, several edited books and various chapters in other books. His publications span a wide range of ecological topics, ranging from population to community ecology, using both field and virtual data. Although most of the studies were done on plants from semi-natural meadows in the Czech Republic, many of them cover different types of organisms and biomes, paying attention to both theoretical and applied aspects of ecology (see Fig. 1 for a summary).

Šuspa's main scientific contributions can be summarized along two main axes. Firstly, there are his studies of species interactions, coexistence and maintenance of diversity; and secondly his deep evaluations and development of specific methods and analytical tools for answering ecological questions related to these topics. Among the most remarkable,

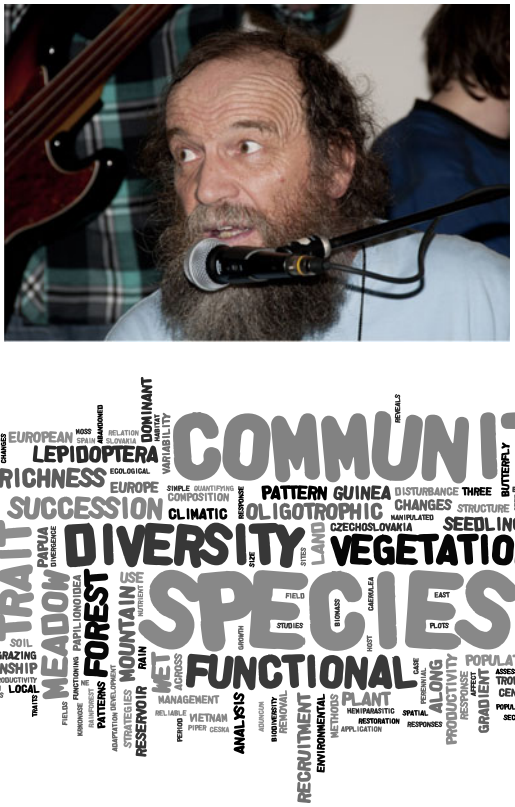

Fig. 1 Topics touched by Jan (Šuspa) Lepš's research, as identified by the www.wordle.net site. This collage shows the most important words in the titles of papers published by Šuspa, the size of the words indicating the frequency of their use

and most cited, outputs we would like to point out the constructive questioning of classical biodiversity experiments (Lepš et al. 2001; Lepš 2004), the remarkable contribution to the understanding of vegetation processes (Lepš et al. 1982; Lepš 1999), the often neglected topic of possible methodological biases in data analyses (Lepš and Hadincová 1992; Lepš 1993, 2001) and the new mathematical solutions proposed (Lepš et al. 2006, 2011).

Šuspa is also the author of a number of aphorisms. For instance, he wisely states that a good ecologist should be able to explain any results, those expected and particularly those not expected. This observation refers to the deep knowledge that, between the patterns existing in nature and those appearing on our computer screens, there are a lot of methodological steps that can make biological results fluctuate between opposing explanations. So, a good ecologist sometimes has to be able to realize that changing just a few parameters in the methodological setups (often uncontrollable) could support opposing theories. For this reason, Šuspa is very self-critical, as are most of his students, of the results he finds in his data, often leading to strong questioning and a certain mistrust of nice and sexy results that could otherwise be published more easily.

Several of the students that had the chance to work with him share this critical view. Šuspa has shaped, and still shapes, the professional trajectories and personalities of many students in the Czech Republic and beyond. Some 15 students have completed or are working on their doctoral theses under his supervision, not to mention the countless students of the Master and Bachelor degree. Each year a large number of students attend his diversified courses at the University of South Bohemia, including more than 250 students from all continents (except Antarctica, so far) that have attended his lectures on multivariate analyses. As far as we are aware, there is not a single student that was not happy to work with Šuspa. This probably has multiple reasons. Firstly, Šuspa is certainly not somebody who would put pressure on his pupils; he often accepts even the biggest mistakes with a smile (or, in some cases, a shot of spirit). Secondly, he gives freedom to his students to develop what they like most (here we do not refer only to spirits) and, last but not least, students feel that he cares about them and their well-being.

Finally, in addition to the rich assemblage of positive biotic interactions with individuals of the same species, we highlight the existence of the same positive relationship across species and trophic levels. Šuspa loves all kind of flowers; with this affection materialized in his contribution to our understanding of plant ecology and the protection of plant diversity. This applies to all sorts of organisms he has studied or helped students to study and protect. There is probably only one genus that has suffered considerably from Šuspa's life history. Here we refer to the genus *Sus*, which is so essential to the happiness of the Šuspa specimen. One of his most famous aphorisms supporting our claim is "prase je prase" (literally this means "a pig is a pig" but actually it is implying that "pig meat is the best food on Earth"), which evidences the superior importance of pork in Šuspa's daily diet, as compared to any other kind of nutriment.

Challenging Existing Trade-offs

As we have shown above, Šuspa is a strange biological case, often falling out of the mainstream and breaking generally accepted trade-offs. As we respect his critical approach to the existing ecological literature, the aim of this paper was to assess whether the case of Šuspa is a wider phenomenon among plant ecologists interacting with him. We have therefore focused on the question of whether the relationships described by

Tomáš Grim apply to Šuspa's entourage of plant ecologists. Although the results of Grim have already been correctly put into general context (Moyna-Larano 2008; Sheil et al. 2008; Grim 2009; Lortie 2010; Parker et al. 2010; and further explored in http://www.zoologie.upol.cz/osoby/Grim/Media_reports_Beer_vs_science.html), we decided to assess the generality of the relationship using a specific case study, with new real data, as the original study by Grim was the only one using data at the individual level.

Methods

We have organized an online survey targeting a selected group of potential respondents. This group was defined by the following *a priori* criteria: the researcher has a PhD degree or presently works towards it, (s)he works in the field of plant ecology or is a member of the same department as Šuspa (Dept. of Botany). External participants also had to be students or co-authors of Šuspa, but we have extended this set to other plant ecologists that offered to contribute a research paper for this special issue of *Folia Geobotanica*. We are aware that the sampling of individuals could not be random and statistically sound, but we believe that neither the original study by Grim is a particularly good example in this regard.

The anonymous forms were sent from the web survey page by e-mail, so we had no knowledge about the identity of individual records, with the exception of a few respondents who asked us to compute their h-index or voluntarily identified themselves in a text field. The form has two entries for the response variables, 1) estimating research impact: h-index representing the count of n best-cited publications that had been cited at least n-times (Hirsch 2005) and 2) the total number of publications in periodicals with assigned impact factor (IF). As both measures tend to increase with researcher age, we have divided their values by the approximate number of years since the respondent received a PhD degree. To maintain anonymity, our form did not ask about the exact number of years but rather time categories e.g. "still working on it", 0–2, 2–6, 6–10, 10–14,…, 30–35, 35–40, and over 40. To account for doctoral students as well, we took the centre of the interval and added one to it, so that, for example, "0–2" respondents got the value of 2, while PhD students the value of 1. The standardized h-index corresponds more or less to the so-called m-index (von Bohlen and Halbach 2011), except we use the PhD degree year rather than the year of the first published paper. The standardized number of papers in IF journals is then simply the yearly production of such papers. The form also requested respondents to estimate the rate of alcohol consumption at the present time, expressed as the number of alcohol units (see http://en.wikipedia.org/wiki/Alcohol_units) consumed per week in the past year, as well as to provide an estimate of the consumption in the last year before submitting the PhD thesis. We also asked whether beer or wine dominates in the respondents' present consumption. Additionally, we inquired about the respondent' gender, whether (s)he has kids and whether (s)he plays an instrument (at least six times a year).

Results and Discussion

We analyzed 57 valid submissions, and the responses are summarized in Table **1**. Three responses were excluded, as our trust in their validity was somehow limited.

Table 1 Summary statistics for the survey data received from 57 respondents. We count the choices for nominal variables and present median, minimum and maximum statistics for the numeric variables. Standardized forms of the h-index and number of publications in IF journals are also summarized

Question / field	Summary statistics
h-index	m = 12, range = (1, 62)
standardized h-index	m = 1.0, range = (0.31, 4.78)
number of papers in journals with IF (*NIF*)	m = 26, range = (2, 227)
standardized NIF (number of papers per year)	m = 2.89, range = (0.44, 18.56)
alcohol consumption at present (units per week)	m = 9, range = (0, 36)
alcohol consumption at PhD (units per week)	m = 10, range = (0, 42)
preferred beverage at present	wine – 31, beer – 26
has kids	yes – 41, no – 16
plays instrument	yes – 21, no – 36
years since PhD degree (approximate)	m = 8, range = (0, 33)

For example, someone consuming 10 wine bottles per week would have, in our opinion, serious difficulty to fill out our web form correctly, and similarly, an entry claiming to be from a PhD candidate, yet with 140 papers and an h-index of 46 did not look very convincing. Our primary focus was on the relationship between the standardized h-index (or standardized number of research publications) to the present consumption of alcohol and the consumption at the start of career.

Considering that the information encoded in the standardized h-index is correlated with the standardized number of publications (r=0.86, P<0.001), we present only the results using h-index as the response variable. We have also looked at the effect of other predictors and their potential impacts on scientific productivity. We have used a plain general linear regression, with log-transformed h-index values (as we have *a priori* expected multiplicative effects of the studied factors).

In analyses using all 57 observations, the present alcohol consumption had no effect on publication results. Interestingly, however, the consumption at the start of the PhD career (*AlcoThen*) was significant. As our *a priori* expectation was that consumption of alcohol increases scientific output, a one-sided test must be applied here, with $F_{1,55}$=3.90, P=0.0267 (but even for those not trusting the positive effect, P=0.053 is not so bad). Here is the fitted regression equation:

$$\log(h.std) = -0.1148 + 0.01326 * AlcoThen$$

So what does this equation tell us? Given the average log(*h.std*) has a value of 0.0448, we can easily show (via (0.0448+0.1148)/0.01326) that new PhD students should be recommended to drink at least 12 units per week to achieve average h-index value output in their future careers in plant ecology. And the more, the better: every increase of their consumption by 10 units per week increases the expected h-index by more than 14 % (exp(10*0.01326)). One should, however, be cautious about extrapolating this beyond the sampled range of consumption (see Table 1). We also tested whether this result varied with the type of consumed alcohol (beer *vs* wine), testing both the main effect of *Type* and its interaction with the *AlcoThen* variable, but neither of the new model terms were significant ($F_{1,53}$=0.07, n.s. and $F_{1,53}$=1.44, n.s.

– respectively). It therefore does not matter what you drink, your scientific performance should increase anyway!

When we started to divide our data according to ecologist gender, significant results were revealed (see also Fig. 2): fitting the h-index on the present alcohol consumption (*AlcoNow*) for boys yielded no significant relationship, but this was not so for girls:

$$\log(h.std) = -0.5397 + 0.0492 * AlcoNow$$

with $F_{1,9}$=4.91, P=0.027. Moreover, a similarly strong positive effect of alcohol consumption on girls was found (see Fig. 2) for the initial alcohol consumption, too ($F_{1,9}$=9.02, P=0.0074). In the right-hand panel of Fig. 2 (i.e. boys), one can perhaps see a slight unimodal relationship (with moderate drinking increasing the productivity), but a test for a polynomial effect is not significant ($F_{1,43}$=0.17, n.s.).

So, for female PhD students, the message is rather clear – you know how to achieve desired results! And as a soothing assurance, kids have nothing to do with it (they neither change the research output nor affect alcohol consumption): $F_{1,7}$=0.49, n.s. for the main effect of kids, and $F_{1,7}$=0.15, n.s. for the interaction with *AlcoThen*. The situation is more serious for boys, however: $F_{1,42}$=3.50, P=0.068 for the kids main effect, which is nearly significant and the effect is negative: having kids could possibly decreases your "hirschy" performance by 17 %! Finally, we found no significant effect of gender on the h-index in our dataset, nor – sadly – any effect of playing music. Yet there is a significant positive correlation between present alcohol consumption and playing an instrument ($F_{1,55}$=5.39, P=0.024), which seems to confirm our earlier assumption that there is some fun in pubs (including pubs like the Hammond Café, which might contribute to this positive correlation)!

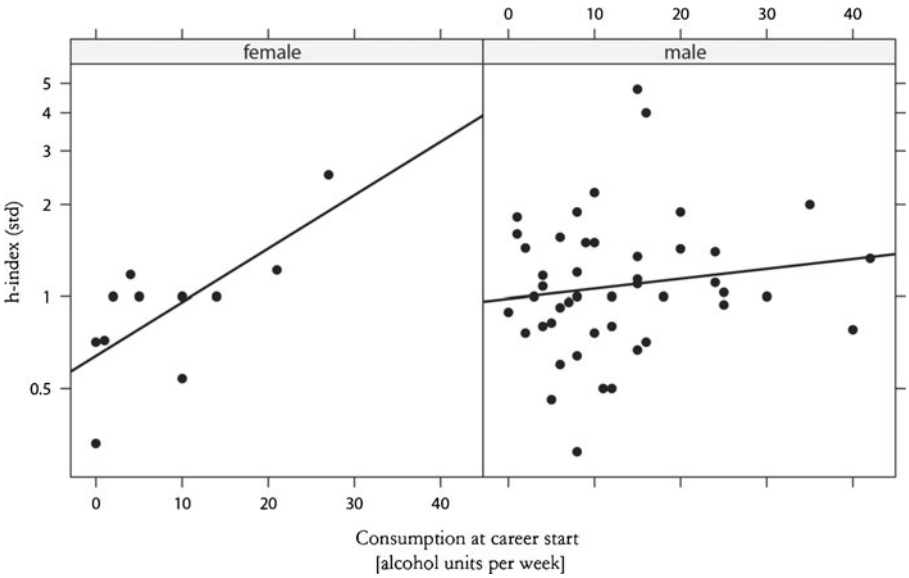

Fig. 2 Relationship between standardized h-index and weekly consumption of alcohol at the start of the research career for females and males. Fitted linear model for log-transformed h-index values is shown; it is, however, not significant for the *male* group

Comparison with Grim's Work

We are aware that the results of this study might apply only to certain populations of researchers. After all, not all researchers share strange combinations of traits yet are scientifically very productive. As such, we are aware these results might apply only in a limited number of cases. They nonetheless seem to challenge the generality of the patterns discussed by Grim (2008). If our study applies only to specific populations, it seems that the analysis by Grim (2008) was probably affected by outliers, e.g. by 2–3 very heavy drinkers with low publication records which were, probably by chance, selected within his case study. We believe we can safely conclude that many researchers should not be particularly concerned when consuming a moderate amount of alcohol. As mentioned above, we also believe that plant ecologists, in particular, have the advantage of being able to drink a couple of beers whilst studying stationary (depending on the number of beers) populations without risking their experiment. Increased data collection, after all, could imply higher chances to have scientific outputs.

Conclusions

People interacting with Šuspa apparently also share a great deal of unusual trait combinations, either because of the direct influence of Šuspa or because "similis cum similibus", i.e. similar people interact better with their own sort. It is clear that the traits possessed by Šuspa as well as his colleagues and students can be useful in given habitats and especially under the competitive conditions of scientific environments. We hope that this study will help students acknowledge that their somewhat unbalanced combination of traits can actually be a strong point for achieving both a serious and an enjoyable scientific career.

While our story centres around the unique case of Jan Šuspa Lepš, whose 60th birthday gives us an opportunity to make a little fun of his truly remarkable achievements, there is a moral for the readers as well: for God's sake, do not let others normalize your values and habits into the range of a "normal" member of your society! In the end, you might become a more respectable and happy person if you resist the temptation to become standardized. From the evolutionary point of view, we believe that bizarre combinations of traits can indeed lead to success in life.

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