# Perceptions of gendered-challenges in academia: How women academics see gender hierarchies as barriers to achievement 

Hande Eslen-Ziya © | Tevfik Murat Yildirim ©

Department of Media and Social Sciences, University of Stavanger, Stavanger, Norway

## Correspondence

Hande Eslen-Ziya, Department of Media and Social Sciences, University of Stavanger, Kjell Arholms gate 41, 4021 Stavanger, Norway. Email: hande.eslen-ziya@uis.no


#### Abstract

Despite the egalitarian and collegial philosophy in its ideals, academic market is segregated and gendered where women receive fewer rewards than their male counterparts, are under-represented, segregated and excluded from participation in the formal and informal academic structures in academia. The country contexts, the gendered academic organizational settings as well as everyday interactions all play a major role not only in women's participation within academia, but also how they perceive their future in academic institutions. This research note, through an original survey with over 200 academics, attempts to study the latter assumption by looking at women academics' perceptions of their work life, their challenges, as well as aspirations. Our results show that those perceiving strong hierarchy in the realm of work are significantly more likely to believe that being woman in academia harms their job prospects. We also show that, not only were they pessimistic about the challenges facing them at the moment, but they were also more skeptical about women's potential in overcoming such challenges in the future.


[^0]© 2021 The Authors. Gender, Work \& Organization published by John Wiley \& Sons Ltd.

## KEYWORDS

academia, gender-challenges, gender hierarchies, higher education

## 1 | INTRODUCTION

Extant research demonstrates that gender inequalities in the workplace still persists, despite the attempts to alleviate such inequalities (Correll, 2017; Carnes et al., 2012; Monroe et al., 2008; Morley, 2000, 2013, 2014). This is evident from women's relative absence in leadership and senior academic positions, and from the disproportionately high rates of women "opting out" from academia (Schneider et al., 2011). Though there is ample research focusing on gendered barriers for women's representation within academia, relatively little attention has been paid to how women academics' own perceptions of challenges in the workplace is related to perceptions of hierarchy at higher education institutions. To fill this gap, we explore in this study the determinants of perceived challenges in the workplace among academics, from fairness of evaluations to relative difficulty of getting promoted, by placing perceptions of hierarchy at the center of our research.

To that end, we designed an original survey looking at both women academics' perceptions of their work life, their challenges, as well as aspirations. Specifically, our survey aims to reveal how perceptions of gendered-challenges among women academics are linked to their perceptions of hierarchy at the higher education institution they are affiliated with. Our results from a series of logistic regressions suggest strong statistical association between perceived hierarchy within the institution and perceptions of gendered-challenges. Strikingly, we show that those perceiving strong hierarchy in the realm of work are significantly more likely to believe that being woman in academia harms their job prospects. Furthermore, not only were they pessimistic about the challenges facing them at the moment, but they were also more skeptical about women's potential in overcoming such challenges in the future. These results have important implications for the study of gender inequality at higher education institutions, which we discuss in greater detail in the concluding section.

## 2 | PERCEPTIONS OF GENDERED CHALLENGES IN ACADEMIA

Despite the egalitarian and collegial philosophy in its ideals, academic market is segregated and gendered (Poole et al., 1997; Toren, 1990). Women academics tend to receive on average fewer rewards than their male counterparts and are promoted at a slower pace (Schneider et al., 2011). Although differences might exist across disciplines and countries, women are under-represented and segregated in academia (Morley, 1994). Accordingly, excluded from participation in the formal and informal academic structures (Hawkins \& Schultz, 1990), women have more difficulty obtaining a "reputational status." Hence, gender inequalities in academia are produced and reproduced through an interaction of factors operating at various levels (Morley, 2000). The country contexts, gendered academic organizational settings as well as everyday interactions all play a major role not only in women's participation within academia, but also how they perceive their future in academic institutions.

By taking critical gender theory as our theoretical framework, we define gender as a "socially constructed, produced and reproduced in interactions that occur in particular contexts; that is, we "do gender" in the process of negotiations" (Kolb, 2000, p. 350). Such negotiations in return sustain structured inequalities between men and women (Acker, 1990; Connell, 1987, 1995, 2005) and attach different traits to formations of masculinities and femininities. Gender then serves as a structure that opts "what gets privileged and side lined" (Blackmore, 2014, p. 86).

Research on gender hierarchies in academia, while pointing out the existing gender discrimination in the employment status of men and women (Bagilhole \& White, 2011; Monroe et al., 2008; Morley, 2013, 2014; Šadl, 2009), reveals a masculinized discourse running within the academy (Knights \& Richards, 2003; Savigny, 2014). This strand of
research emphasizes the impact of meritocratic system producing the domination of masculine values as well as practices. Such masculine culture and its discursive practices in return work to the advantage of men (and disadvantage of women, minority, or LGBTIQ academics), sustaining gendered academic hierarchies. Knights and Richards (2003, p. 238) call this "masculine appropriation of universal ethics for academia" where both men and women are expected to work by in accordance with its standards.

According to Savigny (2014), it is due to these hegemonic masculine norms that women academics feel as the "other" not belonging within academia. Pacholok (2009) argues that the occupational culture continuously reinforces such norms. Hegemonic masculinities (Connell, 1995, 2002; Connell \& Messerschmidt, 2005) refer to patterns of practices that legitimize men's dominant position and justify subordination of both feminine traits and alternative masculinities. Hegemonic masculinities in return help sustain gendered hierarchies. Examples of such gendered hierarchies are widespread in academia, as universities are gendered organizations where senior positions dominated by men who tend to receive higher salaries and promotions (O'Hagan et al., 2019; O'Connor et al., 2017). Research has also shown that women tend to hold more teaching intensive and less research-oriented positions with supervision and administration duties (referred to as care work in academia), compared with their male counterparts (Angervall \& Beach, 2018; Lynch \& Ivancheva, 2015), which has important implications for women's career prospects.

Such gendered-challenges generate what Hall and Sandler (1982) refer to as a culturally "chilly climate" for women within academia. This expression highlights how women's role within higher education becomes invisible or not valued. When women's input is not acknowledged, devalued or accepted, it will result in not only a loss of confidence in their work and of their future in academia but may even lead to marginalization of women academics, their work and ideas (Prentice, 2000; Savigny, 2014). In this paper, through the perceptions of our participants about their working life, their challenges, as well as their aspirations, we will show how these dominant cultural norms within academia are linked to perceptions of gendered challenges at higher education institution.

## 3 | DATA AND METHODS

We conducted an original survey with over 200 women academics working at geographically diverse universities at different levels (including PhD fellows) and from different disciplines. We shared the online survey from June to September 2018 and once again in October to November 2019 with our networks to recruit respondents, where we asked questions concerning their perceptions of workplace experiences and gender equality. While a great majority of our respondents come from European countries, we also received responses from academics working in the US, Mexico, Australia, and Brazil. Many of our participants reported working outside their country of origin at the time of our survey. This is mere effect of internationalization and mobility that became a dominant policy discourse in higher education today (Morley et al., 2018). The highest number of academic migrations were from Turkey (15\%) followed by Mexico (11\%) and Spain (8\%).

Our questionnaire composed of questions on the work environment, work satisfaction, stress, academic duties and allocation of tasks and resources, and thoughts on gender equality. It started with participants' key demographics (age; family status; etc.) and specific academic field and position. It then focused on perceptions of gender equality at work. The survey also had a question on measures that the participants thought could help to increase the number of women in top academic and leadership positions.

We utilize five dependent variables that measure a key aspect of perceived gendered challenges facing academics in the workplace, where we asked the respondents if they have experienced (i) receiving biased evaluations, (ii) injustice in getting the desired position, (iii) lower chance of promotion, and (iv) exclusion from formal and informal networks at work. Our fifth dependent variable measures future expectations regarding gendered challenges (coded as 1 if the respondent said their gender will remain as an obstacle to their career advancement in the future). Since all our dependent variables are binary variables, taking the form of 0 or 1 , we estimate logistic regressions models with
robust standard errors. As coefficients from non-linear models are difficult to interpret, we additionally report simulated predicted probabilities to illustrate the substantive impact of our variables of interest.

Our independent variables include such personal characteristics as whether one (i) has children, (ii) works outside the home country, (iii) holds a PhD, (iv) or a tenured position, (v) as well as one's perceived satisfaction with role at the home institutions. Slightly more than one-third and nearly 56 percent of our respondents reported working at a higher education institution outside the home country, and reported holding a PhD degree, respectively. Among those holding a PhD degree, 40 respondents reported working as either "associate professor" or "full professor." We present the descriptive statistics of our key variables in Table 1.

Though one might argue that our sample is not representative, we believe that it offers a rich mixture of academics in different career phases and academic disciplines, united with an interest in gender inequalities in academia. We conceive this as an advantage since our goal is to identify shared struggles and to highlight critical voices within the academia. We also discuss specific issues related to being feminist researchers.

## 4 | RESULTS

To that extent that our theoretical expectations are correct, we expect women academics' perceptions of hierarchy among faculty members to be correlated with perceptions of gendered challenges facing academics at higher education institutions. Specifically, we expect that those perceiving greater hierarchy in the workplace also perceive bigger challenges due to their gender. Results from a series of logistic regressions testing these expectations are reported in Table 2. Starting with perceptions of biased evaluations, Model 1 indicates that those reporting the presence of strong hierarchies in the workplace are significantly more likely to acknowledge bias in performance evaluations ( $p<0.01$ ). Besides the satisfaction variable, no other variable appears to be an important determinant of one's perceptions of bias in evaluations. Models 2 through 4 paint a similar picture, where perceptions of hierarch are strongly correlated with one's self-assessment of the workplace. In particular, the models show that those who reported strong hierarchy in the workplace were significantly more likely to state that their chance of (i) getting a desired position and (ii) promotions is lower, and that they face higher chance of getting excluded from formal and informal networks, compared to their male counterparts. While the perceived hierarchy variable comes up statistically significant only at the $p<0.1$ level in Model 2 (desired appointment), the statistical significance appears to be much higher in Model 3 and 4 ( $p<0.02$ and $p<0.006$, respectively). Taken together, Models 1 through 4 suggest that perceptions of hierarchy are strongly associated with women academics' gender-related challenges in the workplace.

We delve further into the link between gendered-challenges in the workplace today and academics' future expectations in regard to challenges facing them due to their gender. Specifically, Model 5 documents the conditions under which one perceives her gender to be an obstacle to advancing one's career in the future. As in other models, the variable "Strong hierarchy" carries a positive coefficient and reaches statistical significance at the $p<0.05$ level, indicating a strong association between perceived hierarchy in the workplace and pessimism regarding potential gender-related challenges that academics expect to face in the future. This implies that not only do perceptions of hierarchy in the workplace shape perceptions of gendered-challenges facing academics today, they also diminish women academics' hopes about overcoming such challenges in the future.

Although the above analysis points to strong statistical associations between perceptions of challenges and the presence of hierarchy in the workplace, they do not shed light into the substantive importance (i.e., effect sizes) of these relationships. Estimating a series of simulated probabilities, we attempt to delve further into the substantive effect of perceptions of hierarchy on perceptions of gendered-challenges in the workplace. Holding other variables constant at their means, a hypothetical change from 0 to 1 in the "Strong Hierarchy" variable increases the likelihood of reporting "biased evaluations due to gender" from 0.28 to 0.50 (a 78 percent increase, $p<0.05$ ), the likelihood of reporting "difficulty in getting desired position due to gender" from 0.22 to 0.34 (a 54 percent increase, $p<0.1$ ), the likelihood of "reporting harder promotion due to gender" from 0.20 to 0.41 (a 101 percent increase, $p<0.05$ ), and the

TABLE 1 Summary statistics

|  | N | Mean | Std. dev. | Min | Max |
| :--- | :--- | :--- | :--- | :--- | :--- |
| Biased evaluations | 210 | 0.381 | 0.487 | 0 | 1 |
| Getting desired positions | 210 | 0.3 | 0.459 | 0 | 1 |
| Harder promotion | 210 | 0.329 | 0.471 | 0 | 1 |
| Exclusion from networks | 210 | 0.276 | 0.448 | 0 | 1 |
| Future expectations about gendered-challenges | 210 | 0.562 | 0.497 | 0 | 1 |
| No hierarchy | 210 | 0.443 | 0.498 | 0 | 1 |
| No child | 210 | 0.586 | 0.494 | 0 | 1 |
| Expat | 210 | 0.362 | 0.482 | 0 | 1 |
| PhD | 210 | 0.552 | 0.498 | 0 | 1 |
| Prof Assoc Prof | 210 | 0.19 | 0.394 | 0 | 1 |
| Satisfaction w/role | 210 | 0.248 | 0.433 | 0 | 1 |

TABLE 2 Perceived satisfaction and hierarchies in the workplace - logistic regressions

|  | Biased evaluations | Desired appointment | Promotions | Exclusion from networks | Future challenges |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
| Strong hierarchy | $1.020^{* * *}$ | 0.589* | 0.978*** | 0.770** | $0.784^{* *}$ |
|  | (0.316) | (0.340) | (0.357) | (0.332) | (0.308) |
| No children | 0.212 | 0.0267 | -0.310 | -0.221 | 0.0813 |
|  | (0.340) | (0.339) | (0.345) | (0.373) | (0.356) |
| Expat | 0.120 | -0.273 | 0.109 | 0.359 | 0.208 |
|  | (0.315) | (0.349) | (0.342) | (0.328) | (0.312) |
| PhD | 0.354 | 1.496*** | $1.646^{* *}$ | -0.187 | -0.823** |
|  | (0.348) | (0.376) | (0.382) | (0.368) | (0.365) |
| Tenured faculty | 0.536 | -0.252 | -0.0152 | -0.0598 | -0.530 |
|  | (0.429) | (0.433) | (0.444) | (0.489) | (0.430) |
| Satisfaction with role: Disagree | 0.744** | 1.006*** | 1.260*** | 0.308 | 0.897** |
|  | (0.336) | (0.347) | (0.357) | (0.365) | (0.384) |
| Constant | $-1.634^{* * *}$ | -2.204*** | $-2.429^{* * *}$ | -1.314*** | 0.156 |
|  | (0.439) | (0.450) | (0.483) | (0.454) | (0.419) |
| AIC | 273.37 | 239.24 | 232.99 | 252.47 | 270.81 |
| BIC | 296.8 | 262.67 | 256.42 | 275.9 | 294.24 |
| Observations | 210 | 210 | 210 | 210 | 210 |

Note: Robust standard errors in parentheses.
Abbreviations: AIC, akaike information criterion; BIC, bayesian information criterion.
${ }^{* * *} p<0.01,{ }^{* *} p<0.05,{ }^{*} p<0.1$.
likelihood of reporting "exclusion from formal and informal networks due to gender" from 0.20 to 0.36 (a 76 percent increase, $p<0.05$ ). In other words, controlling for other factors, increasing levels of perceived hierarchy result in substantively important changes in perceived challenges facing academics. Strikingly, the same hypothetical change in the perception of hierarchy in the workplace increases the likelihood of expecting future challenges due to gender from 0.48 to 0.68 (a 40 percent increase).

## 5 | CONCLUDING REMARKS: A WAY FORWARD?

This paper was an attempt to show how perceptions of gendered-challenges among women academics are linked to their perceptions of hierarchy at the higher education institution they are affiliated with. In order to realize how women academics view their working experiences, specifically the perceived challenges in the workplace, we examined their perceptions about academic career paths via an original survey with women academics from around the world. Our results suggest that perceptions of hierarchy in the workplace play an important role in shaping academics' perceptions of gendered-challenges, as well as their future expectations regarding such challenges. Specifically, we show that increased levels of perceived hierarchy in the workplace are strongly associated with higher likelihood of naming gendered-challenges at higher education institutions, and with higher likelihood of expecting future gendered-challenges. In this respect our survey analysis provides a picture of globally gendered and persistent problems within academia often disadvantaging women. Our findings bring an additional perspective to the existing research on gender hierarchies in academia focusing on the vertical and horizontal segregation (Morley, 2013; Park, 2020).

While research on vertical segregation within academia discusses women's under-representation within academia, the horizontal segregation focuses on under-representation of women in certain professions and majors. Our research on the other hand studies how the existing dynamics and challenges at their given institutions are perceived through a gendered lens. In other words, our goal was not to identify the degree of such segregation - be it vertical or horizontal - but to study the impact of academic hierarchies on the propensity to mention various gendered-challenges facing women in academia. Our results clearly highlight the need to discuss how existing hierarchies within the academia hinder attempts to achieve gender equality in various aspects of academic life.

Constructing all-inclusive academic environment is essential to overcome gendered-challenges within academia. Once these existing stereotypes molded with personal experiences are reflected in the perceptions of women academics themselves, they may further strengthen barriers for academic career developments. The challenges facing women in academia have become more evident with the current COVID-19 pandemic where gendered consequences for women academics have surfaced across the globe as the demand to combine work and life balance was heightened (AI-Ali, 2020; Minello, 2020; Yildirim \& Eslen-Ziya, 2020). As Craig (2020, p. 1) puts it, "the coronavirus crisis has made brutally clear that care work, both paid and unpaid, is fundamental to our economic and social survival." Whether or not the aftereffects of COVID-19 will allow for a more gender egalitarian higher education is something we will see in the coming years.

## ACKNOWLEDGMENTS

Special thanks to Sevil Sümer, who was one of the original authors of the survey used in this paper. Our gratitude goes to the women academics who has shared their experiences and challenges with us.

## CONFLICT OF INTEREST

The authors declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

## DATA AVAILABILITY STATEMENT

Research data are not shared.

## ORCID

Hande Eslen-Ziya (iD) https://orcid.org/0000-0001-7113-6771
Tevfik Murat Yildirim (D) https://orcid.org/0000-0001-7120-6020

## REFERENCES

Acker, J. (1990). Hierarchies, jobs and bodies: A theory of gendered organizations. Gender \& Society, 4(2), 139-158.
Al-Ali, N. (2020). Covid-19 and feminism in the global south: Challenges, initiatives and dilemmas. European Journal of Women's Studies, 27(4), 333-347.
Angervall, P., \& Beach, D. (2018). The exploitation of academic work: Women in teaching at Swedish universities. Higher Education Policy, 31(1), 1-17.
Bagilhole, B., \& White, K. (Eds.). (2011). Gender, power and management: A cross-cultural analysis of higher education. Springer.
Blackmore, J. (2014). "Wasting talent"? Gender and the problematics of academic disenchantment and disengagement with leadership. Higher Education Research and Development, 33(1), 86-99.
Carnes, M., Devine, P. G., Isaac, C., Manwell, L. B., Ford, C. E., Byars-Winston, A., Fine, E., \& Sheridan, J. (2012). Promoting institutional change through bias literacy. Journal of Diversity in Higher Education, 5(2), 63-77.
Connell, R. W. (1987). Gender and power: Society, the person and sexual politics. Polity.
Connell, R. W. (1995). Masculinities. University of California Press.
Connell, R. W. (2002). Gender. Polity Press.
Connell, R. W. (2005). Change among the gatekeepers: Men, masculinities, and gender equality in the global arena. Signs: Journal of Women in Culture and Society, 30(3), 1801-1825.
Connell, R. W., \& Messerschmidt, J. W. (2005). Hegemonic masculinity: Rethinking the concept. Gender \& Society, 19(6), 829-859.
Correll, S. (2017). Reducing gender biases in modern workplaces: A small wins approach to organisational change. Gender \& Society, 31(6), 725-750.
Craig, L. (2020). COVID-19 has laid bare how much we value women's work, and how little we pay for it, the Conversation. https://the-conversation.com/covid-19-has-laid-bare-howmuch-we-value-womens-work-and-how-little-we-pay-for-it-136042
Hall, R. M., \& Sandler, B. C. (1982). The classroom climate: A chilly one for women?
Hawkins, A. C., \& Schultz, D. (1990). Women: The academic proletariat in west Germany and The Netherlands. In S. Stiver Lie, \& V. E. O'Leary (Eds.), Storming the tower women in the academic world. Kogan Page; Nichols/GP.
Knights, D., \& Richards, W. (2003). "Sex discrimination in UK academia." Gender, Work and Organization, 10(2), 213-238.
Kolb, D. M. (2000). More than just a footnote: Constructing a theoretical framework for teaching about gender in negotiation. Negotiation Journal, 16(4), 347-356.
Lynch, K., \& Ivancheva, M. (2015). Academic freedom and the commercialisation of universities: A critical ethical analysis. Ethics in Science and Environmental Politics, 15(1), 71-85.
Minello, A. (2020). The pandemic and the female academic. Nature. https://doi.org/10.1038/d41586-020-01135-9
Monroe, K., Ozyurt, S., Wrigley, T., \& Alexander, A. (2008). Gender equality in academia: Bad news from the trenches, and some possible solutions. Perspectives on politics. American Political Science Association, 6(2), 215-233.
Morley, L. (1994). Glass ceiling or iron cage: Women in UK academia. Gender, Work and Organization, 1(4), 194-204.
Morley, L. (2000). The micropolitics of gender in the learning society. Higher Education in Europe, 25(2), 229-235.
Morley, L. (2013). The rules of the game: Women and the leaderist turn in higher education. Gender and Education, 25(1), 116-131.
Morley, L. (2014). Lost leaders: Women in the global academy. Higher Education Research and Development, 33(1), 114-128.
Morley, L., Alexiadou, N., Garaz, S., González-Monteagudo, J., \& Taba, M. (2018). Internationalisation and migrant academics: The hidden narratives of mobility. Higher Education, 76(3), 537-554.
O'Connor, P., López, E. M., O'Hagan, C., Wolffram, A., Aye, M., Chizzola, V., Mich, O., Apostolov, S., Topuzova, I., Saglamer, G., Tan, M. G., \& Caglayan, H. (2017). Micro-political practices in higher education: A challenge to excellence as a rationalising myth? Critical Studies in Education, 48(1), 1-17.
O'Hagan, C., O'Connor, P., Myers, E. S., Baisner, L., Apostolov, S., Topuzova, I., Saglamer, G., Tan, M. G., \& Caglayan, H. (2019). Perpetuating academic capitalism and maintaining gender orders through career practices in STEM in universities. Critical Studies in Education, 60(2), 205-225.
Pacholok, S. (2009). Gendered strategies of self: Navigating hierarchy and contesting masculinities. Gender, Work and Organization, 16(4), 471-500.
Park, S. (2020). Seeking changes in ivory towers: The impact of gender quotas on female academics in higher education. Women's Studies International Forum, 79, 102346.
Poole, M., Bornholt, L., \& Summers, F. (1997). An international study of the gendered nature of academic work: Some cross-cultural explorations. Higher Education, 34(3), 373-396.
Prentice, S. (2000). The conceptual politics of chilly climate controversies. Gender and Education, 12(2), 195-207.
Šadl, Z. (2009). "We women are No good at it': Networking in academia." Czech Sociological Review, 45(6), 1239-1263.
Savigny, H. (2014). Women, know your limits: Cultural sexism in academia. Gender and Education, 26(7), 794-809.
Schneider, B. Z., Carden, W., Francisco, A., \& Jones, T. O., Jr (2011). Women "opting out" of academia: At what cost. Forum on Public Policy, 2(1), 1-19.

Toren, N. (1990). Would more women make a difference? In S. Stiver Lie, \& V. E. O'Leary (Eds.), Storming the tower: Women in the academic world. Kogan Page; Nichols/GP.
Yildirim, T. M., \& Eslen-Ziya, H. (2020). The differential impact of COVID-19 on the work conditions of women and men academics during the lockdown. Gender, Work and Organization, 28(S1), 243-249.

## AUTHOR BIOGRAPHIES

Hande Eslen-Ziya has an established interest in gender and social inequalities, transnational organizations, and digital activism and has a substantial portfolio of research in this field. Currently, she co-edited the book titled The Aesthetics of Global Protest: Visual Culture and Communication published at Amsterdam University Press. Eslen-Ziya is the Co-I of Covid-19 project funded by the Norwegian Research Council (2020-2022): "Fighting pandemics with enhanced risk communication: Messages, compliance and vulnerability during the COVID-19 outbreak" Dr. Eslen-Ziya is Professor of Sociology at the University of Stavanger and director of the Populism, Anti-Gender and Democracy Research Group.

Tevfik Murat Yildirim is an Associate Professor at the University of Stavanger, Norway. His research focuses on legislative politics, public opinion, and gender politics, and has appeared in various journals including American Political Science Review, British Journal of Political Science, Journal of European Public Policy, Party Politics, and Political Behavior, among others.

How to cite this article: Eslen-Ziya, H., \& Yildirim, T. M. (2022). Perceptions of gendered-challenges in academia: How women academics see gender hierarchies as barriers to achievement. Gender, Work \& Organization, 29(1), 301-308. https://doi.org/10.1111/gwao. 12744


[^0]:    Hande Eslen-Ziya and Tevfik Murat Yildirim contributed equally to this work.

    This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

