

Female genital mutilation is an adaptation to inter-sexual conflict, whereas male genital mutilation is primarily an adaptation to inter- and intra-group conflict in polygynous patricentric societies.

Investigating cultural adaptations to sexual conflict in the ethnographic record: A phylogenetic comparative study of male and female genital mutilations

Gabriel Šaffa, Jan Zrzavý, and Pavel Duda
Faculty of Science, University of South Bohemia, České Budějovice, Czechia

INTRODUCTION

- Male and female genital mutilations (MGM and FGM) come at high health, survival, and reproduction costs
- Hypothesized as adaptations to sexual conflict (via reducing sperm competition and paternity uncertainty; Wilson 2008) and inter- and intra-group conflict (via enhancing trust and commitment to the group; Paige and Paige 1982, Sosis et al. 2007)
- Cross-cultural associations found between genital mutilations and polygyny and frequency of warfare
- We performed global phylogenetic comparative analysis using MGM and FGM as response variables and 28 minimally colinear predictors

METHODS

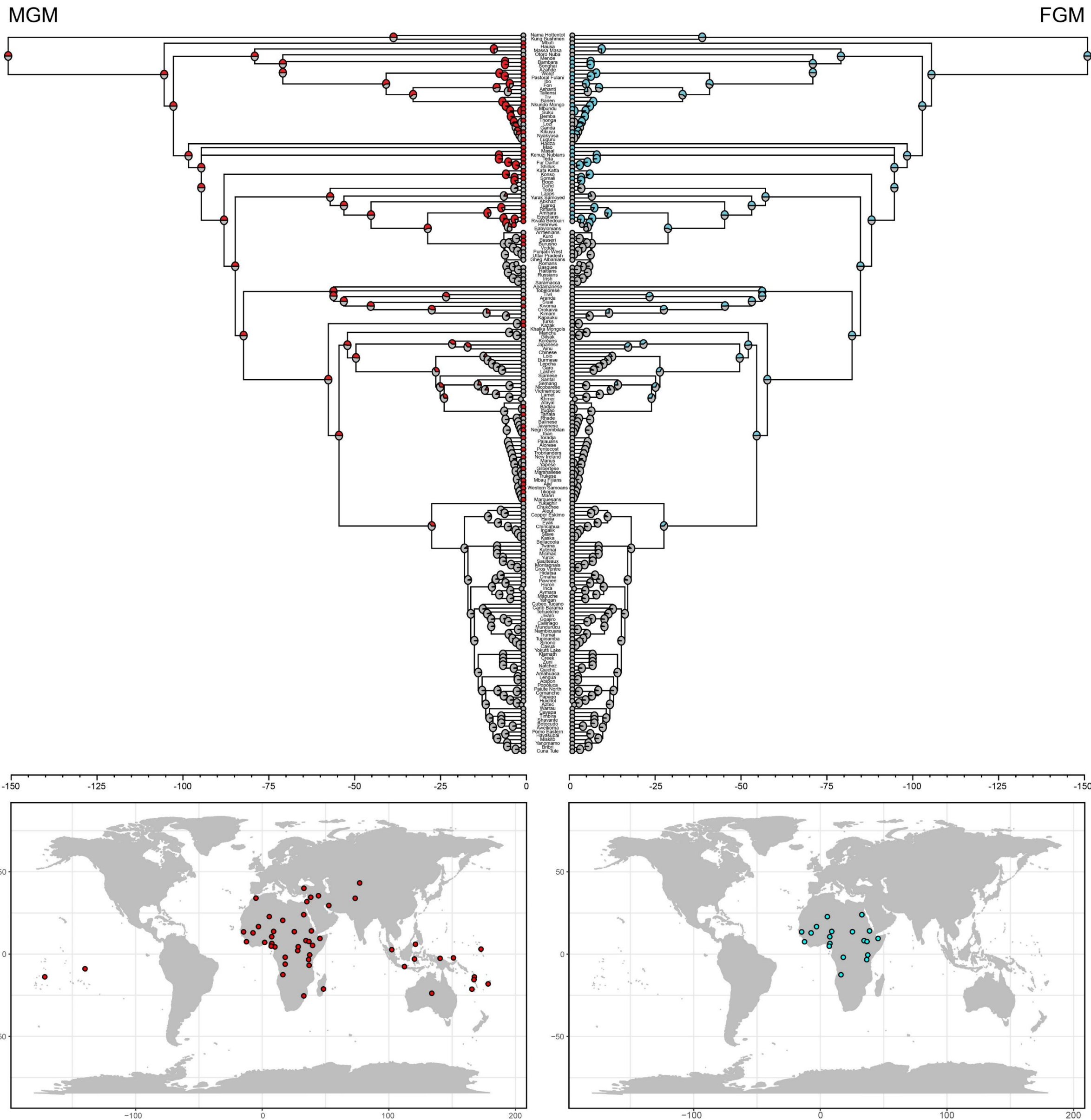
- Data from the SCCS and eHRAF supplemented by recently published studies (N=186 societies)
- Multiple imputation of missing values (mice package)
- Time-calibrated supertree of human populations (Duda & Zrzavý 2016; Minocher et al. 2019)
- Maximum likelihood ancestral state reconstruction (phytools package)
- Correlated evolution of discrete traits (BayesTraits)
- Phylogenetic logistic regression for binary dependent variables (phylolm, rr2 packages)

RESULTS

- Multiple independent origins of MGM in Africa (Mande, Ubangian, Bantu, Nilo-Saharan, and Berber and Semitic speaking societies) and Remote Oceanic group of Austronesian speakers; FGM only in African societies
- Presence of MGM is best predicted by patrilineality, male scarification practices, frequency of female premarital sex, and frequency of external warfare
- Presence of FGM is best predicted by increasing distance between co-wives, patrilocality, female scarification practices, and bride-price
- Including MGM or FGM as predictors of each other substantially improves model fit (AIC) and explained variance (R^2)

DISCUSSION

- MGM is not primarily an adaptation to sexual conflict sensu Wilson (2008)
- Rather, MGM is a costly signal of group commitment in patricentric societies aiding in intra- (Paige and Paige 1982) and inter-group conflict (Sosis et al. 2007)
- FGM is a possible adaptation to paternity uncertainty in polygynous societies where inter- and intra-sexual conflict is high
- MGM and FGM are likely special cases or by-products of body scarifications



Maximum likelihood ancestral state reconstruction and geographical distribution of MGM (left) and FGM (right).

Table 1. Best models predicting the incidence of MGM (without FGM as predictor).

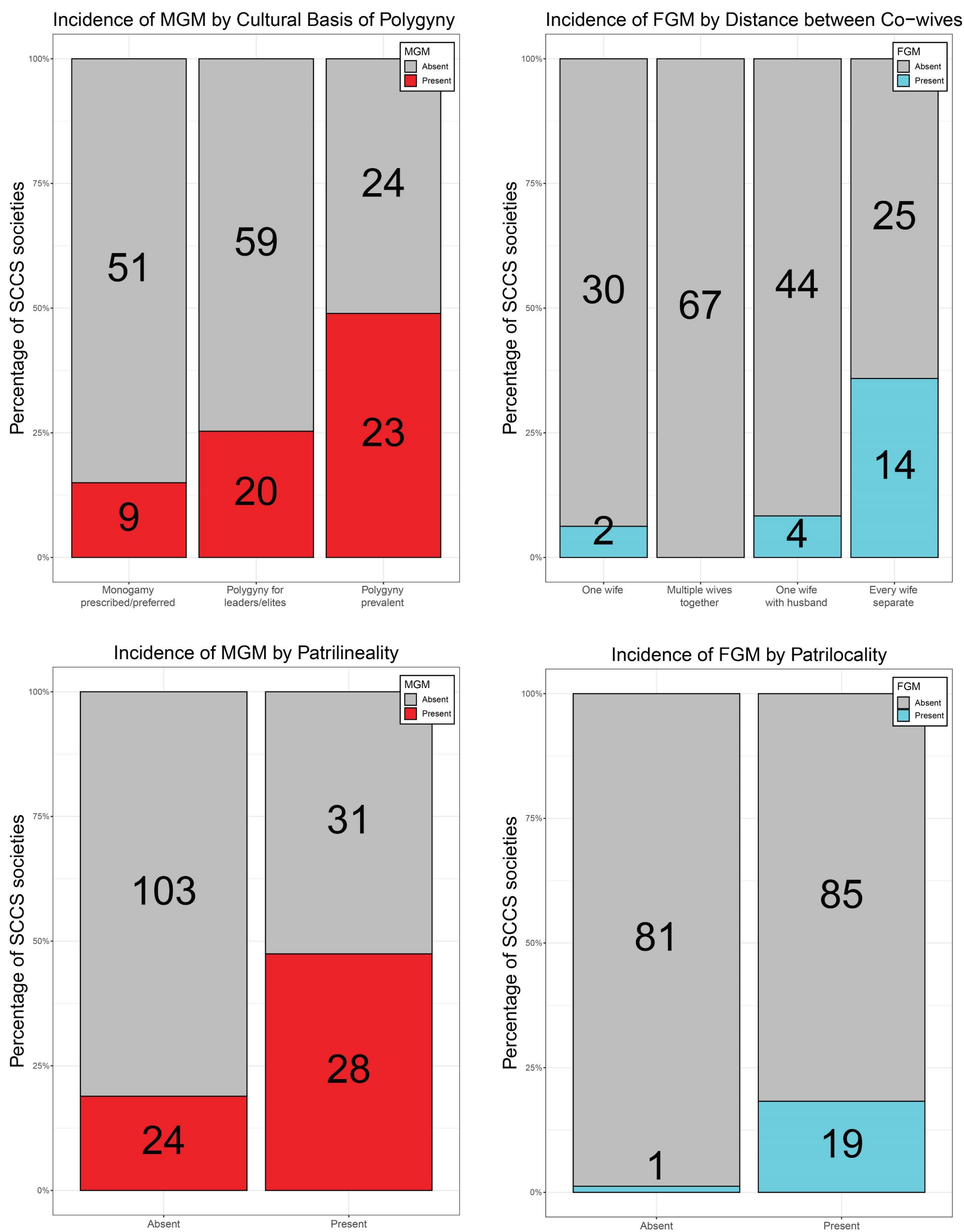
#	formula	AIC	R ² .lik
1.	~ CulturalBasisPolygyny + ScarificationM + FreqPremSexF + Patriline + BridePrice	153.82	0.506
2.	~ CulturalBasisPolygyny + ScarificationM + FreqPremSexF + Patriline + ExternalWarfare	153.88	0.506
3.	~ CulturalBasisPolygyny + ScarificationM + FreqPremSexF + Patriline + BridePrice + ExternalWarfare	154.13	0.514
4.	~ ScarificationM + FreqPremSexF + Patriline + BridePrice + ExternalWarfare	154.38	0.503
5.	~ CulturalBasisPolygyny + ScarificationM + FreqPremSexF + Patriline	156.94	0.480

Bold indicates significant values at $p < 0.05$.

Table 2. Best models predicting the incidence of FGM (without MGM as predictor).

#	formula	AIC	R ² .lik
1.	~ DistanceCowives + ScarificationF + Patriloc + BridePrice	93.26	0.440
2.	~ DistanceCowives + ScarificationF + Patriloc	94.65	0.411
3.	~ DistanceCowives + Patriloc + Pastoralism	95.33	0.405
4.	~ DistanceCowives + Patriloc	95.68	0.384

Bold indicates significant values at $p < 0.05$.



Barplots indicating associations between MGM (left) and FGM (right) and predictors significantly associated with them based on phylogenetic logistic regression analyses.

