

## Supplementary Material

**Tab. S1** - Results of spatial and forest structure variables model.

Variables	B	S.E.	Wald	df	Prob.	Exp(B)
Shrub %	0.043	0.028	2.412	1	0.120	1.044
Shrub_Type	-	-	6.287	5	0.279	-
Shrub_Type(1)	20.917	7.158.416	0.000	1	0.998	1.213
Shrub_Type(2)	-1.615	1.168	1.913	1	0.167	0.199
Shrub_Type(3)	0.905	1.106	0.670	1	0.413	2.472
Shrub_Type(4)	-2.936	1.658	3.134	1	0.077	0.053
Shrub_Type(5)	-0.821	1.182	0.483	1	0.487	0.440
Stone_Size	-	-	5.016	3	0.171	-
Stone_Size(1)	1.769	2.801	0.000	1	1.000	5.867
Stone_Size(2)	-21.872	2.459	0.000	1	0.999	0.002
Stone_Size(3)	-20.578	2.459	0.000	1	0.999	0.002
Stone %	0.078	0.020	14.817	1	0.000	1.082
Distance_PureCedrus	-1.897	1.228	2.384	1	0.123	0.150
Distance_Broad	1.419	0.522	7.383	1	0.007	4.135
Constant	17.480	2.459	0.000	1	0.999	3.904

**Tab. S2** - Results of topographic variables model.

<b>Variables</b>	<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Prob.</b>	<b>Exp(B)</b>
Aspect	-	-	17.342	8	0.027	-
Aspect(1)	-4.837	1.759	7.559	1	0.006	0.008
Aspect(2)	-23.951	4.019	0.000	1	1.000	0.001
Aspect(3)	-23.207	2.100	0.000	1	0.999	0.001
Aspect(4)	-25.218	2.100	0.000	1	0.999	0.001
Aspect(5)	-2.001	1.562	1.642	1	0.200	0.135
Aspect(6)	18.721	1.791	0.000	1	0.999	1.349
Aspect(7)	-2.076	1.554	1.785	1	0.181	0.125
Aspect(8)	-3.648	1.901	3.683	1	0.055	0.026
Slope	-	-	8.517	4	0.074	-
Slope(2)	1.711	0.600	8.124	1	0.004	5.535
Slope(3)	18.947	2.428	0.000	1	0.999	1.692
Slope(4)	1.810	1.142	2.513	1	0.113	6.110
Slope(5)	2.493	1.342	3.450	1	0.063	12.098
Curvature	-	-	5.653	2	0.059	-
Curvature(1)	-3.038	1.472	4.260	1	0.039	0.048
Curvature(2)	0.420	0.432	0.942	1	0.332	1.522
Hillshade(2)	-21.707	2.100	0.000	1	0.999	0.001
Constant	24.036	2.100	0.000	1	0.999	2.745

**Tab. S3** - Results of spectral variables model.

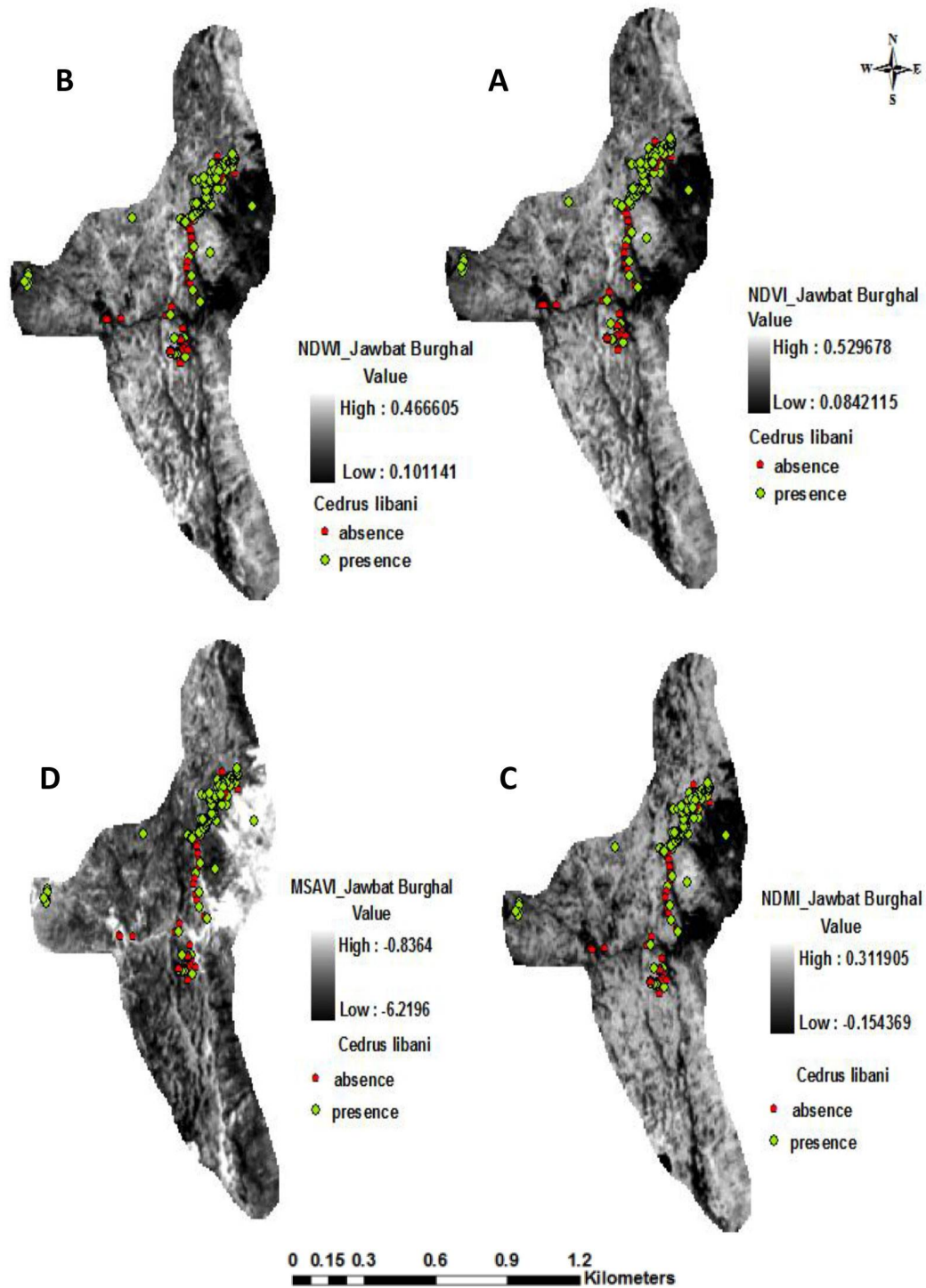
<b>Variables</b>	<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Prob.</b>	<b>Exp(B)</b>
NDWI	-1.552	0.464	11.159	1	0.001	0.212
NDMI	-1.225	0.429	8.163	1	0.004	0.294
MSAVI	-1.423	0.392	13.177	1	0.000	0.241
DI	19.467	1.514	0.000	1	0.999	2.846
SR	1.251	0.755	2.749	1	0.097	3.494
SMI	1.318	0.419	9.893	1	0.002	3.738
Constant	-13.480	1.514	0.000	1	0.999	0.001

**Tab. S4** - Results of environmental variables model.

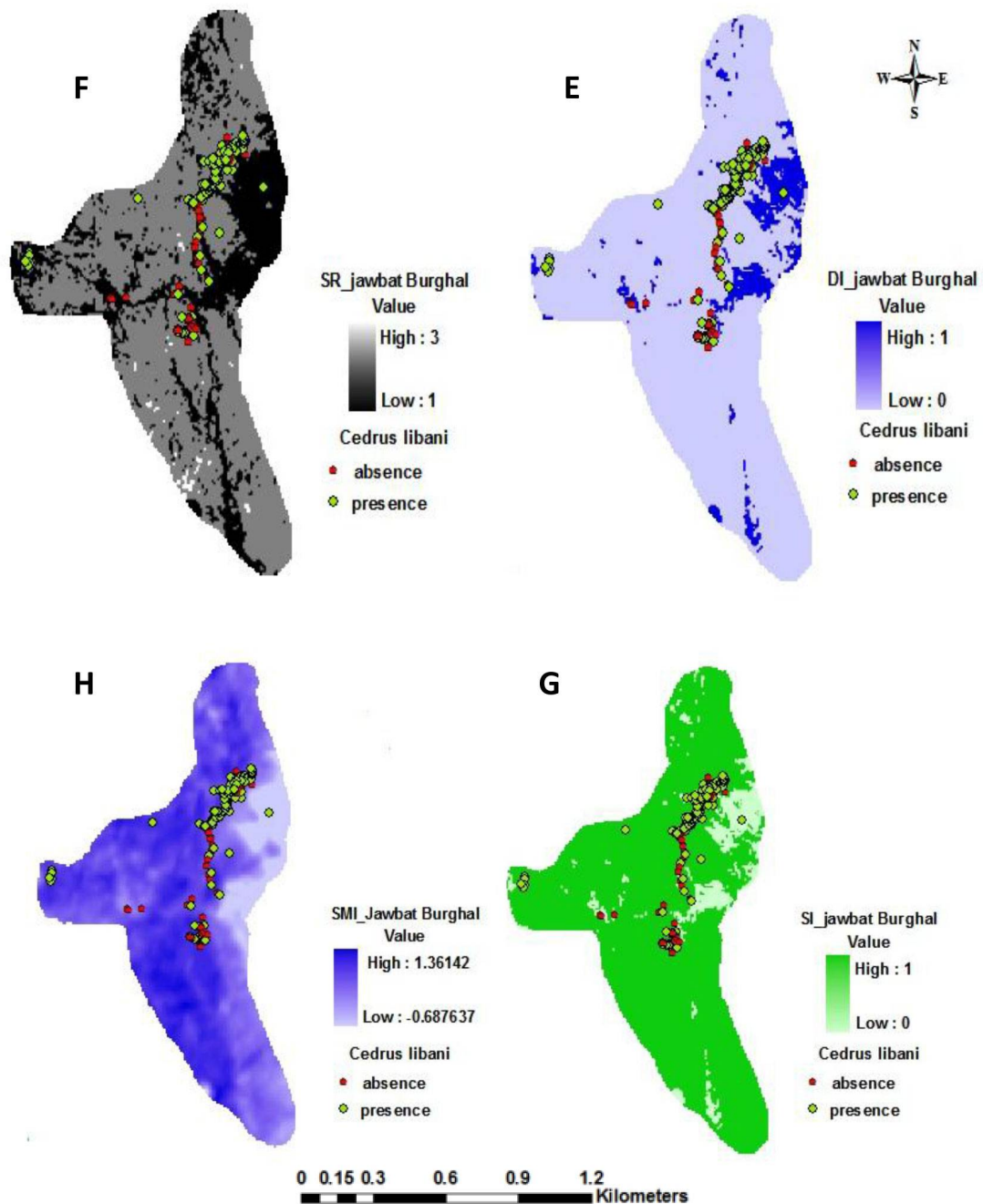
<b>Variables</b>	<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Prob.</b>	<b>Exp(B)</b>
Elevation	-10.252	4.886	4.403	1.000	0.036	0.002
Aspect	-	-	4.546	5.000	0.474	-
Aspect(1)	52.935	23.516	0.000	1.000	0.998	9.755
Aspect(2)	58.247	23.516	0.000	1.000	0.998	1.979
Aspect(3)	79.877	23.516	0.000	1.000	0.997	4.901
Aspect(4)	111.050	23.516	0.000	1.000	0.996	1.692
Aspect(5)	110.362	23.516	0.000	1.000	0.996	8.506
Slope	-	-	5.370	3.000	0.147	-
Slope(2)	7.267	5.212	1.944	1.000	0.163	1.432
Slope(3)	40.204	19.863	4.097	1.000	0.043	2.886
Slope(4)	32.594	17.232	3.578	1.000	0.059	1.430
Eastness	-12.293	5.849	4.418	1.000	0.036	0.003
Northness	-7.631	4.245	3.232	1.000	0.072	0.002
Distance_Broad	7.094	3.364	4.446	1.000	0.035	1.204
Distance_Road	-36.172	156.084	0.054	1.000	0.817	0.001
NDVI	-11.683	6.488	3.243	1.000	0.072	0.001
NDMI	-13.814	6.387	4.677	1.000	0.031	0.002
MSAVI	-5.664	3.214	3.105	1.000	0.078	0.003
DI	73.363	10.440	0.000	1.000	0.994	7.263
SR	13.421	8.638	2.414	1.000	0.120	6.739
SMI	21.684	10.004	4.698	1.000	0.030	2.612
Type	-	-	7.187	4.000	0.126	-
Type(1)	-36.676	17.484	4.400	1.000	0.036	0.003
Type(2)	-3.512	25.165	0.000	1.000	1.000	0.030
Type(3)	-5.637	7.371	0.585	1.000	0.444	0.004
Type(4)	-1.762	7.168	0.060	1.000	0.806	0.172
Cover %	0.238	0.159	2.228	1.000	0.135	1.268
Shrub %	1.352	0.629	4.625	1.000	0.032	3.866
Shrub_Type	-	-	4.372	5.000	0.497	-
Shrub_Type(1)	48.608	5.278	0.000	1.000	0.993	1.288
Shrub_Type(2)	-28.400	14.043	4.090	1.000	0.043	0.002
Shrub_Type(3)	-10.987	6.627	2.749	1.000	0.097	0.002

<b>Variables</b>	<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Prob.</b>	<b>Exp(B)</b>
Shrub_Type(4)	-67.792	33.162	4.179	1.000	0.041	0.002
Shrub_Type(5)	-11.660	6.004	3.771	1.000	0.052	0.002
Litter_Thick	-9.652	4.347	4.930	1.000	0.026	0.002
Litter_Type	-	-	4.788	2.000	0.091	-
Litter_Type(1)	10.788	5.167	4.359	1.000	0.037	4.843
Litter_Type(2)	40.646	19.099	4.529	1.000	0.033	4.488
Stone_Size	-	-	4.658	3.000	0.199	-
Stone_Size(1)	26.919	31.295	0.000	1.000	0.999	4.905
Stone_Size(2)	-23.647	25.145	0.000	1.000	0.999	0.002
Stone_Size(3)	-10.619	25.145	0.000	1.000	1.000	-
Stone %	0.415	0.172	5.851	1.000	0.016	1.514
Constant	-54.159	35.976	0.000	1.000	0.999	0.002

**Fig. S1** - Spectral indices maps of Jawbat Burghal forest. A: NDVI Index, B: NDWI Index, C: NDMI Index, D: MSAVI Index.



**Fig. S2** - Spectral indices maps of Jawbat Burghal forest. E: DI Index , F: SR Index, G: SI index, H: SMI index.



**Fig. S3** - Topographic maps of Jawbat Burghal forest. A: Elevation layer, B: Slope, C: Aspect, D: the Curvature layer.

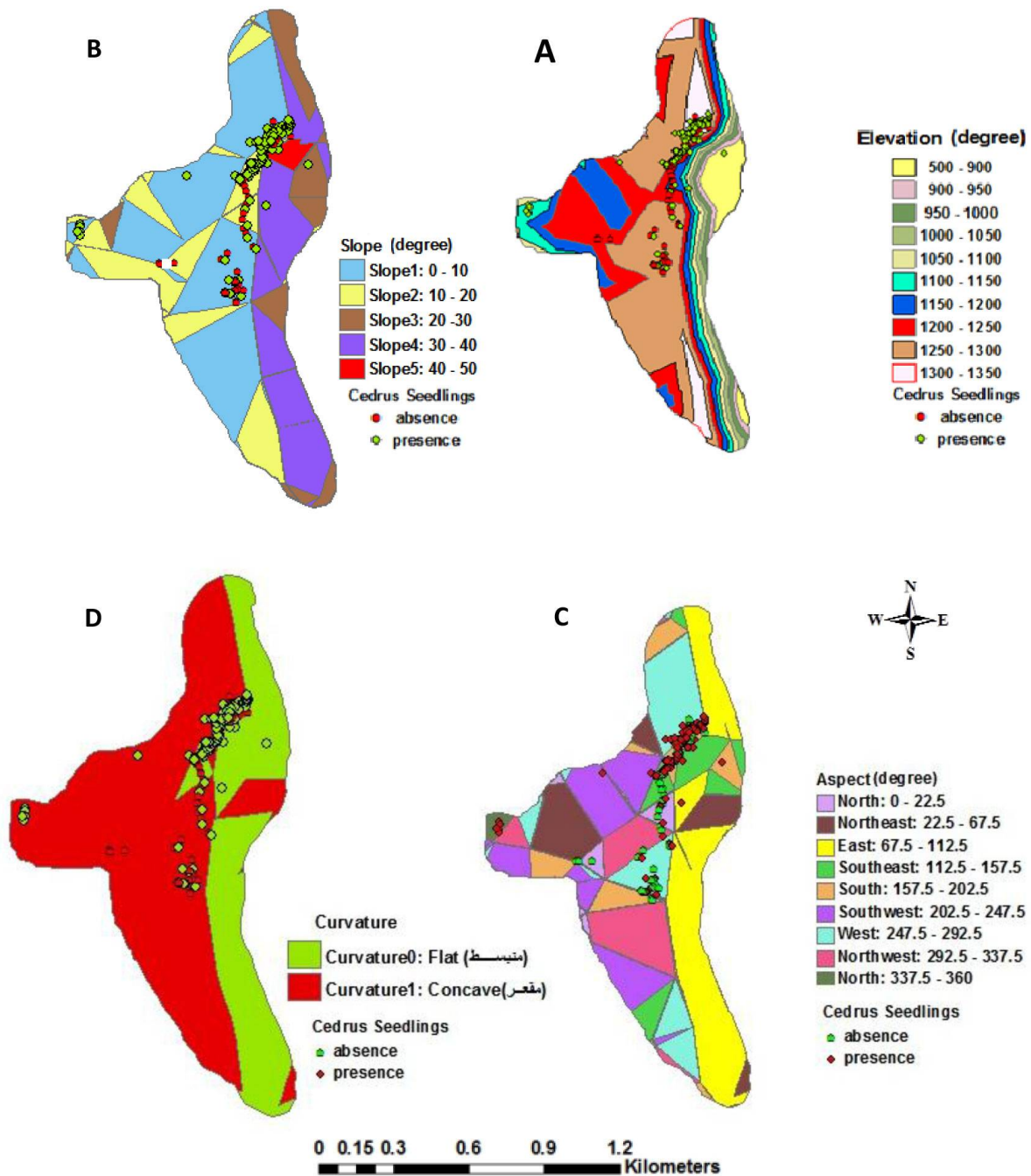


Fig. S4 - Spatial distribution of sample plots and environmental gradients in Jawbat Burghal forest..

