

Table S1. Variance analysis of physiological traits of different tarragon accessions under different levels of water deficit

| SOV | df | RWC | Chl a | Chl b | Chl a+b | Chla/Chlb | Car | Car/ Chl |
|----------------------------------|----|----------------------|---------|---------|---------|-----------|----------|----------|
| Block | 2 | 75.54 | 0.00008 | 0.00009 | 0.001 | 0.126 | 0.0001 | 0.00013 |
| Factor A (Water deficit) | 4 | 1348.46** | 1.229** | 0.418* | 3.077** | 9.701** | 0.003* | 0.0885** |
| Error A | 4 | 11.205 | 0.00067 | 0.0005 | 0.001 | 0.086 | 0.00025 | 0.00012 |
| Factor B (Accessions) | 11 | 690.728** | 0.144** | 0.013** | 0.241** | 0.086* | 0.0155** | 0.0016** |
| AB | 22 | 35.506 ^{ns} | 0.011** | 0.002** | 0.02** | 0.119** | 0.0013** | 0.0008 |
| Error B | 66 | 26.224 | 0.00083 | 0.00028 | 0.001 | 0.04 | 0.00028 | 0.00016 |

RWC: Relative water content; **Chl a:** Chlorophyll a; **Chl b:** Chlorophyll b; **Chl a+b:** Total chlorophyll; **Chla/Chlb:** Chlorophyll a/ b ratio; **Car:** Carotenoid;

Car/ Chl: Carotenoid/ Total chlorophyll ratio

* and ** Significantly at the probability level of %5 and %1, respectively.

Table S1 (continued). Variance analysis of physiological traits of different tarragon accessions under different levels of water deficit

| SOV | df | CAT | SOD | GPX | APX | MDA | El |
|----------------------------------|----|----------|-----------|---------|---------|-----------|------------|
| Block | 2 | 0.022 | 0.087 | 0.005 | 0.005 | 0.867 | 25.613 |
| Factor A (Water deficit) | 4 | 12.059** | 251.331** | 0.162** | 7.524** | 411.235** | 4030.882** |
| Error A | 4 | 0.008 | 0.297 | 0.00026 | 0.004 | 0.61 | 7.021 |
| Factor B (Accessions) | 11 | 1.159** | 33.093** | 0.025** | 0.658** | 9.894** | 140.634** |
| AB | 22 | 0.224** | 5.268** | 0.006** | 0.178** | 2.864** | 48.146** |
| Error B | 66 | 0.008 | 0.259 | 0.0015 | 0.022 | 0.747 | 19.539 |

CAT: Catalase; **SOD:** Superoxide dismutase; **GPX:** Guaiacol peroxidase; **APX:** Ascorbate peroxidase; **MDA:** Malondialdehyde; **El:** Electrolyte leakage.

* and ** Significantly at the probability level of %5 and %1, respectively.

Table S2. The mean Comparison effects of water deficit on physiological traits

| Accessions | Physiological traits | | | | | | | | | | | | |
|-------------------|----------------------|--------------|--------------|----------------|----------------------------|---------|-------------|---------|---------|---------|---------|----------|-----------|
| | RWC | Chl <i>a</i> | Chl <i>b</i> | Chl <i>a+b</i> | Chl <i>a</i> /Chl <i>b</i> | Car | Car/ Chl | CAT | SOD | GPX | APX | MDA | EL |
| Isfahan | 57.72 e | 0.98 h | 0.32 f | 1.3 gh | 3.2 abc | 0.31 e | 0.25 a | 1.36 gh | 8.28 ef | 0.15 e | 1.52 de | 7.37 b | 43.29 a |
| Abadeh | 57.43 e | 0.97 h | 0.31 f | 1.28 f | 3.25 ab | 0.3 e | 0.25 ab | 1.3 h | 7.81 fg | 0.2 d | 1.6 cd | 8.82 a | 39.05 bc |
| Semirom | 58.9 de | 0.97 h | 0.34 e | 1.32 g | 2.96 d | 0.3 e | 0.24 b | 1.3 h | 7.51 g | 0.2 d | 1.36 f | 8.92 a | 40.75 ab |
| Neishabour | 70.48 b | 1.18 c | 0.38 bc | 1.57 c | 3.08 bcd | 0.34 cd | 0.22 c | 1.87 c | 10.52 c | 0.21 d | 2 b | 6.44 cd | 31.34 ef |
| Zarand | 64.25 c | 1.12 de | 0.38 bc | 1.5 d | 3.14 a-d | 0.31 e | 0.21 c | 1.41 g | 8.39 e | 0.2 d | 1.55 de | 9.09 a | 36.33 cd |
| Estahbanat | 70.27 b | 1.07 f | 0.36 d | 1.44 e | 3.08 bcd | 0.3 e | 0.21 c | 1.61 e | 9.57 d | 0.2 d | 1.71 c | 7.54 b | 35.05 cde |
| Anonymous | 62.96 cd | 1.13 d | 0.37 cd | 1.5 d | 3.17 abc | 0.33 d | 0.22c | 1.78 d | 10.12 c | 0.23 d | 1.72 c | 7.01 bc | 34.27 de |
| Birjand | 63.46 cd | 1.1 ef | 0.38 c | 1.48 d | 3.03 cd | 0.35 c | 0.24 ab | 1.52 f | 8.23 ef | 0.24 cd | 1.65 cd | 7.7 b | 35.47 cde |
| Kermanshah | 66.49 bc | 1.03 g | 0.32 ef | 1.36 f | 3.29 a | 0.31 e | 0.24 b | 1.51 f | 8.03 ef | 0.14 e | 1.44 ef | 8.67 a | 36.33 cd |
| Varamin | 82.08 a | 1.2 c | 0.4 b | 1.6 b | 3.02 cd | 0.38 b | 0.24 b | 2.26 a | 12.9 a | 0.33 a | 2.11 ab | 6.15 d | 30.03 f |
| Yazd | 80.68 a | 1.23 b | 0.39 b | 1.63 b | 3.15 a-d | 0.38 b | 0.24 b | 2.28 a | 12.57 a | 0.27 bc | 2.17 a | 6.52 cd | 32.5 def |
| Hamadan | 78.59 a | 1.4 a | 0.44 a | 1.85 a | 3.18 abc | 0.43 a | 0.24 b | 2.07 b | 11.72 b | 0.28 b | 1.99 b | 6.92 bcd | 32.08 ef |

۱۵

۱۶ **RWC:** Relative water content; **Chl *a*:** Chlorophyll *a*; **Chl *b*:** Chlorophyll *b*; **Chl *a+b*:** Total chlorophyll; **Chl*a*/Chl*b*:** Chlorophyll *a*/*b* ratio; **Car:** Carotenoid;

۱۷ **Car/ Chl:** Carotenoid/ Total chlorophyll ratio; **CAT:** Catalase; **SOD:** Superoxide dismutase; **GPX:** Guaiacol peroxidase; **APX:** Ascorbate peroxidase; **MDA:**

۱۸ Malondialdehyde; **El:** Electrolyte leakage.

۱۹ *Mean comparison was performed by LSD method at 5% probability. Columns with similar letters did not differ significantly.

۲۰

۲۱

۲۲

۲۳

۲۴

۲۵

Table S3. The mean Comparison of interaction effects of water deficit and tarragon accessions on physiological traits

| Physiological traits | | | | | | | | | | | | | |
|------------------------|-----------|--------------|--------------|----------------|----------------------------|----------|----------|----------|-------------|----------|----------|----------|-----------|
| 100% of Field capacity | | | | | | | | | | | | | |
| Accessions | RWC | Chl <i>a</i> | Chl <i>b</i> | Chl <i>a+b</i> | Chl <i>a</i> /Chl <i>b</i> | Car | Car/ Chl | CAT | SOD | GPX | APX | MDA | EL |
| Isfahan | 63.61 j-n | 1.14 jk | 0.41 ghi | 1.56 lm | 2.79 g-j | 0.32 i-p | 0.21 g-k | 0.96 n | 6.39 uvw | 0.12 pq | 1.11 mn | 3.45 p | 31.2 k-p |
| Abadeh | 60.17 m-q | 1.14 jk | 0.38 hij | 1.53 mn | 2.96 fg | 0.31 l-r | 0.20 g-k | 1.02n | 6.09 vw | 0.19 i-n | 1.30 klm | 5.29 lmn | 20.23 r |
| Semirom | 72.25 e-i | 1.17 hij | 0.41 fg | 1.59 jkl | 2.79 g-j | 0.34 f-j | 0.21 ghi | 0.93 n | 5.87 w | 0.14 nq | 0.92 n | 4.83 m-p | 25.14 o-r |
| Neishabour | 78.92 b-e | 1.26 ef | 0.41 fg | 1.67 fgh | 3.01 efg | 0.35 e-i | 0.21 g-j | 1.01 n | 7.5 q-t | 0.12 pq | 1.44 jkl | 3.97 nop | 21.86 qr |
| Zarand | 70.97 e-j | 1.35 c | 0.49 ab | 1.84 c | 2.74 g-j | 0.33 h-m | 0.18 l | 1.06 mn | 6.78 tuv | 0.17 l-q | 1.15 mn | 6.01 klm | 22.3 qr |
| Estahbanat | 75.73 c-g | 1.13 jkl | 0.41 gh | 1.54 lmn | 2.74 g-j | 0.31 n-s | 0.20 i-l | 1.05 mn | 6.89 s-v | 0.12 opq | 1.32 klm | 4.87 mno | 27.09 m-r |
| Anonymous | 69.98 f-k | 1.20 ghi | 0.43 efg | 1.63 hij | 2.80 g-j | 0.34 g-l | 0.20 g-k | 1.06 mn | 7.19 r-u | 0.19 j-o | 1.44 jkl | 4.15 nop | 24.88 pqr |
| Birjand | 65.77 i-m | 1.25 ef | 0.46 cd | 1.72 ef | 2.71 g-j | 0.38 cd | 0.22 gh | 1.01 n | 6.34 vw | 0.21 g-m | 1.31 klm | 4.31 nop | 25.79 n-r |
| Kermanshah | 74.83 c-h | 1.20 ghi | 0.41 gh | 1.61 ijk | 2.92 gh | 0.34 g-l | 0.21 g-j | 0.97 n | 6.14 vw | 0.10 q | 1.21 lm | 4.55 nop | 25.59 n-r |
| Varamin | 87.8 a | 1.27 def | 0.43 efg | 1.70 efg | 2.92 ghi | 0.37 def | 0.21 ghi | 1.17 m | 7.80 pqr | 0.20 h-n | 1.29 klm | 3.46 p | 25.58 n-r |
| Yazd | 86.77 ab | 1.31 cd | 0.46 bcd | 1.77 d | 2.80g-j | 0.37 cde | 0.21 g-j | 1.18 m | 7.65 qrs | 0.14 n-q | 1.24 klm | 3.64 op | 23.89 qr |
| Hamadan | 87.71 a | 1.52 a | 0.50 a | 2.03 a | 3.00 efg | 0.42 b | 0.21 g-k | 1.07 mn | 7.27 rst | 0.18 j-o | 1.21 lm | 4.54 nop | 25.58 n-r |
| 80% of Field capacity | | | | | | | | | | | | | |
| Isfahan | 55.17 opq | 1.09 lmn | 0.36 jk | 1.46 o | 2.98 efg | 0.31 l-s | 0.21 ghi | 1.48 jkl | 8.73 l-o | 0.15 m-q | 1.62 hij | 6.48 kl | 43.9 cde |
| Abadeh | 59.41 m-q | 1.07 mn | 0.38 j | 1.45 o | 2.83 g-j | 0.30 o-s | 0.21 g-j | 1.38 l | 8.23 n-q | 0.21 g-m | 1.62 hij | 9.76 fgh | 38.49 e-i |
| Semirom | 52.09 q | 1.06 n | 0.41 gh | 1.48 o | 2.59 ij | 0.30 p-s | 0.20 h-k | 1.43 kl | 7.65 qrs | 0.22 e-l | 1.48 ijk | 7.13 jk | 42.09 c-g |
| Neishabour | 70.86 e-j | 1.30 de | 0.44 def | 1.74 de | 2.95 fg | 0.33 i-n | 0.19 jkl | 2.08 e | 11.17 fg | 0.22 f-l | 2.00 ef | 6.01 klm | 32.32 j-o |
| Zarand | 66.81 h-m | 1.16 ijk | 0.42 efg | 1.59 jkl | 2.72 g-j | 0.32 j-q | 0.20h-k | 1.56 ijk | 8.91 k-o | 0.19 i-n | 1.61 hij | 8.63 gh | 38.17 e-k |
| Estahbanat | 69.04 g-l | 1.17 hij | 0.44 de | 1.61 ijk | 2.61 hij | 0.30 p-s | 0.19 kl | 1.75 gh | 10.4 hi | 0.22 f-l | 1.75 gh | 7.21 ijk | 34.58 h-l |
| Anonymous | 56.98 n-q | 1.21 gh | 0.44 def | 1.65 ghi | 2.73 g-j | 0.34 f-k | 0.21 g-k | 1.96 ef | 10.46 gh | 0.23 e-k | 1.91 fg | 6.77 k | 35.13 g-l |

| | | | | | | | | | | | | | |
|-------------------|-----------|----------|----------|----------|----------|----------|----------|---------|----------|----------|----------|----------|-----------|
| Birjand | 63.42 j-o | 1.16 hij | 0.45 de | 1.62 ijk | 2.58 j | 0.36 d-g | 0.22 g | 1.74 gh | 8.54 m-p | 0.22 e-l | 1.74 gh | 6.9 k | 34.01 h-m |
| Kermanshah | 65.76 i-m | 1.12 klm | 0.38 ij | 1.50 no | 2.92 ghi | 0.30 p-s | 0.20 i-l | 1.75 gh | 8.14 opq | 0.14 n-q | 1.47 ijk | 8.56 hi | 34.9 g-l |
| Varamin | 80.76 a-d | 1.28 de | 0.44 de | 1.73 de | 2.86 g-j | 0.36 d-h | 0.21 g-j | 2.54 c | 13.31 c | 0.31 c | 2.05 ef | 6.5 kl | 27.94 l-q |
| Yazd | 81.63 abc | 1.29 de | 0.43 efg | 1.73 de | 2.98 efg | 0.37 def | 0.21 ghi | 2.58 c | 12.75 cd | 0.24 d-j | 2.32 c-d | 6.46 kl | 32.58 j-n |
| Hamadan | 75.02 c-h | 1.45 b | 0.48 abc | 1.94 b | 3.00 efg | 0.41 b | 0.21 ghi | 2.37 d | 12.17 de | 0.26 c-h | 2.21 de | 6.21 klm | 33.31 i-m |

60% of Field capacity

| | | | | | | | | | | | | | |
|-------------------|-----------|----------|---------|----------|----------|----------|---------|----------|----------|----------|----------|-----------|-----------|
| Isfahan | 54.38 pq | 0.69 s | 0.18 p | 0.87 v | 3.84 abc | 0.30 p-s | 0.34 a | 1.65 hi | 9.73 h-k | 0.17 k-p | 1.82 fgh | 12.19 bc | 54.78 ab |
| Abadeh | 52.66 q | 0.69 s | 0.17 p | 0.87 v | 3.95 ab | 0.29 st | 0.33 ab | 1.52 i-l | 9.10 j-m | 0.22 f-l | 1.89 fg | 11.43 cde | 58.45 a |
| Semirom | 52.37 q | 0.69 s | 0.19 op | 0.89 v | 3.51 cd | 0.27 t | 0.30 cd | 1.53 ijk | 9.02 j-n | 0.25 d-i | 1.69 ghi | 14.8 a | 55.04 ab |
| Neishabour | 61.65 k-p | 0.98 o | 0.30 m | 1.29 q | 3.27 def | 0.33 i-o | 0.25 f | 2.53 c | 12.9 cd | 0.3 cd | 2.58 b | 9.34 fgh | 39.82 d-i |
| Zarand | 54.98 pq | 0.86 q | 0.22 no | 1.08 t | 3.95 ab | 0.29 rst | 0.27 ef | 1.61 hij | 9.48 i-l | 0.24 d-j | 1.89 fg | 12.63 bc | 48.55 bc |
| Estahbanat | 66.03 i-m | 0.92 p | 0.23 n | 1.16 s | 3.89 ab | 0.29 q-t | 0.25 f | 2.04 e | 11.6 ef | 0.26 c-g | 2.05 ef | 10.55 def | 43.5 c-f |
| Anonymous | 61.91 k-p | 0.98 o | 0.24 n | 1.23 r | 3.99 ab | 0.32 k-r | 0.25 f | 2.32 d | 12.73 cd | 0.28 cde | 1.81 fgh | 10.11 ef | 42.82 c-f |
| Birjand | 61.18 l-p | 0.87 pq | 0.23 n | 1.11 t | 3.79 abc | 0.32 j-q | 0.29 de | 1.81 fg | 9.82 hij | 0.27 c-f | 1.91 fg | 11.9 bcd | 46.64 cd |
| Kermanshah | 58.87 m-q | 0.77 r | 0.19 p | 0.96 u | 4.03 a | 0.31 m-s | 0.32 bc | 1.83 fg | 9.81 hij | 0.19 i-n | 1.64 hij | 12.9 b | 48.52 bc |
| Varamin | 77.69 c-f | 1.05 n | 0.32 lm | 1.37 p | 3.30 de | 0.40 bc | 0.29 d | 3.08 a | 17.61 a | 0.48 a | 3.01 a | 8.5 hij | 36.6 f-k |
| Yazd | 73.64 c-i | 1.08 lmn | 0.29 m | 1.38 p | 3.68 bc | 0.41 b | 0.30 d | 3.08 a | 17.32 a | 0.43 ab | 2.95a | 9.46 fgh | 41.02 d-h |
| Hamadan | 73.03 d-i | 1.23 fg | 0.34 kl | 1.58 klm | 3.55 cd | 0.47 a | 0.29 d | 2.77 d | 15.74 b | 0.37 b | 2.54 bc | 10.03 efg | 37.36 e-k |

۲۷ **RWC:** Relative water content; **Chl a:** Chlorophyll a; **Chl b:** Chlorophyll b; **Chl a+b:** Total chlorophyll; **Chla/Chlb:** Chlorophyll a/b ratio; **Car:** Carotenoid;

۲۸ **Car/ Chl:** Carotenoid/ Total chlorophyll ratio; **CAT:** Catalase; **SOD:** Superoxide dismutase; **GPX:** Guaiacol peroxidase; **APX:** Ascorbate peroxidase; **MDA:**

۲۹ Malondialdehyde; **El:** Electrolyte leakage. *Mean comparison was performed by LSD method at 5% probability. Columns with similar letters did not differ

۳۰ significantly.

۳۱

۳۲

۳۳

۳۴

Table S4. Variance analysis of phytochemical traits of different tarragon accessions under different levels of water deficit

| SOV | df | DPPH (IC50) | FRAP | Phe | Fla | Chlo | Fer | Caf | Van | Syr |
|---------------------------------|----|------------------------|------------------------|----------|-----------|-----------|------------|-----------|-----------|------------|
| Block | 2 | 0.000065 | 8567.456 | 23.999 | 2.389 | 27.216 | 0.131 | 2.608 | 0.32 | 0.106 |
| Factor A (Water deficit) | 2 | 0.002** | 15710.244* | 589.694* | 478.679* | 330.358** | 130.402** | 35.462** | 254.971** | 443.543** |
| Error A | 4 | 0.000015 | 2152.786 | 52.208 | 13.033 | 11.544 | 0.034 | 1.312 | 0.022 | 0.126 |
| Factor B (Accessions) | 11 | 0.0026** | 78777.577** | 512.48** | 293.022** | 431.124** | 4821.754** | 125.209** | 454.617** | 1955.175** |
| AB | 22 | 0.000012 ^{ns} | 2496.027 ^{ns} | 127.7** | 54.722** | 107.134** | 143.504** | 67.809** | 58.965** | 72.032** |
| Error B | 66 | 0.000036 | 1590.483 | 45.73 | 25.507 | 6.282 | 0.077 | 1.725 | 0.235 | 0.799 |

۳۵

۳۶

Phe: Total phenol; **Fla:** Total flavonoid; **Chlo:** Chlorogenic acid; **Fer:** Ferulic acid; **Caf:** Caffeic acid; **Van:** Vanillic acid; **Syr:** Syringic acid.

۳۷

* and ** Significantly at the probability level of %5 and %1, respectively.

۳۸

۳۹

Table S4 (continued). Variance analysis of phytochemical traits of different tarragon accessions under different levels of water deficit

| SOV | df | <i>p</i> -cou | Her | Cou | Lut | Api | Chi | Gall | Nar | Que |
|---------------------------------|----|---------------|------------|-----------|------------|---------|----------|----------|----------|----------|
| Block | 2 | 0.094 | 4.052 | 0.306 | 89.798 | 0.056 | 0.032 | 0.192 | 0.07 | 0.10 |
| Factor A (Water deficit) | 2 | 44.94** | 12663.6** | 756.059** | 76072.7** | 0.82** | 0.25* | 0.11 | 1.73** | 9.10** |
| Error A | 4 | 0.203 | 6.598 | 0.249 | 11.371 | 0.029 | 0.11 | 0.09 | 0.08 | 0.24 |
| Factor B (Accessions) | 11 | 694.772** | 5326.232** | 799.66** | 268189.9** | 1.88*** | 16.66*** | 40.58*** | 19.89*** | 18.72*** |
| AB | 22 | 48.315** | 500.641** | 159.5** | 12180.04** | 0.46*** | 520*** | 0.197 | 3.04*** | 1.85*** |
| Error B | 66 | 0.306 | 4.249 | 0.198 | 51.722 | 0.037 | 11.55*** | 0.166 | 0.05 | 0.17 |

۴۰

۴۱

***p*-cou:** *p*-coumaric acid; **Her:** Herniarin; **Cou:** Coumarin; **Lut:** Luteolin; **Api:** Apigenin; **Chi:** Chicoric acid; **Gall:** Gallic acid; **Nar:** Naringenin; **Que:** Quercetin

۴۲

* and ** Significantly at the probability level of %5 and %1, respectively.

Table S5. The mean Comparison effects of water deficit on phytochemical traits

| Accessions | Phytochemical traits | | | | | | | | |
|-------------------|----------------------|-----------|-----------|----------|----------|---------|----------|---------|----------|
| | DPPH (IC50) | FRAP | Phe | Fla | Chlo | Fer | Caf | Van | Syr |
| Isfahan | 0.072 cd | 509.48 d | 56.10 bcd | 35.1 cd | 15.91 e | 17.75 b | 11.44 f | 9.89 d | 13.58 ef |
| Abadeh | 0.102 a | 617.85 bc | 55.98 bcd | 34.6 cd | 26.15 b | 0.14 gh | 16.58 c | 1.85 e | 14.59 d |
| Semirom | 0.07 de | 586.83 bc | 52.86 cde | 31.44 d | 23.59 c | 0.37 fg | 15.77 cd | 16.79 b | 0.09 j |
| Neishabour | 0.068 de | 611.81 bc | 56.70 bcd | 35.47 cd | 25.74 bc | 0.6 f | 16.5 c | 1.96 e | 15.69 c |
| Zarand | 0.064 e | 674.49 a | 48.70 ef | 33.14 cd | 19.46 d | 1.69 d | 11.63 f | 14.22 c | 9.15 h |
| Estahbanat | 0.079 c | 690.82 a | 60.73 b | 40.81 b | 29.81 a | 2.65 c | 14.65 d | 10 d | 15.07 cd |
| Anonymous | 0.074 cd | 620.68 b | 58.59 bc | 37.33 bc | 25.99 b | 1.16 e | 15.08 d | 1.54 e | 19.03 b |
| Birjand | 0.043 g | 709.24 a | 68.27 a | 47.35 ab | 24.09 bc | 0.07 h | 18.19 b | 0.0 f | 14.23 de |
| Kermanshah | 0.087 b | 479.45 d | 46.20 f | 31.2 d | 10.49 f | 0.0 h | 12.92 e | 0.0 f | 12.79 fg |
| Varamin | 0.103 a | 402.26 e | 50.39 def | 31.1 d | 8.23 f | 80.7 a | 6.62 g | 0.0 f | 60.09 a |
| Yazd | 0.070 de | 581.76 c | 58.00 bc | 35.67 cd | 21.22 d | 1.42 e | 13.06 e | 0.0 f | 12.47 g |
| Hamadan | 0.056 f | 686.06 a | 72.28 a | 47.46 a | 28.88 a | 0.13 gh | 21.19 a | 17.97 a | 5.9 i |

Phe: Phenol; **Fla:** Flavonoid; **Chlo:** Chlorogenic acid; **Fer:** Ferulic acid; **Caf:** Caffeic acid; **Van:** Vanillic acid; **Sy:** Syringic acid.

* and ** Significantly at the probability level of %5 and %1, respectively.

*Mean comparison was performed by LSD method at 5% probability. Columns with similar letters did not differ significantly.

Table S5 (continued). The mean Comparison effects of water deficit on phytochemical traits

| Accessions | Phytochemical traits | | | | | | | | |
|-------------------|----------------------|----------|---------|----------|--------|---------|--------|--------|--------|
| | <i>p</i> -cou | Her | Cou | Lut | Api | Chi | Gall | Nar | Que |
| Isfahan | 0.0 h | 78.36 b | 0.0 i | 109.73 e | 0.0 c | 0.0 d | 3.71 c | 0.0 c | 3.58 a |
| Abadeh | 0.0 h | 32.32 h | 21.37 c | 111.09 e | 0.0 c | 0.0 d | 4.41 b | 0.0 c | 0.0 c |
| Semirom | 6.62 e | 45.32 g | 8.22 d | 71.81 g | 1.53 a | 0.0 d | 0.0 d | 0.0 c | 0.0 c |
| Neishabour | 0.0 h | 28.82 i | 25.65 a | 239.18 c | 0.0 c | 0.0 d | 0.0 d | 4.07 a | 1.18 b |
| Zarand | 7.56 d | 33.62 h | 3.72 fg | 61.25 h | 0.55 b | 0.2 c | 3.76 c | 0.0 c | 0.0 c |
| Estahbanat | 10.81 b | 47.66 f | 3.32 g | 73.14 g | 0.0 c | 0.0 d | 0.0 d | 3.54 b | 0.0 c |
| Anonymous | 5.37 f | 52.22 e | 4.12 f | 85.66 f | 0.0 c | 0.0 d | 0.0 d | 0.0 c | 0.0 c |
| Birjand | 4.63 g | 55.04 d | 5.22 e | 69.07 g | 0.0 c | 4.23 a | 0.0 d | 0.0 c | 3.93 a |
| Kermanshah | 25.83 a | 78.25 b | 24.95 b | 465.18 b | 0.0 c | 2.58 b | 0.0 d | 0.0 c | 0.0 c |
| Varamin | 25.63 a | 107.54 a | 0.78 h | 591.49 a | 0.0 c | 0.16 cd | 0.0 d | 0.0 c | 0.0 c |
| Yazd | 8.59 c | 26.64 j | 3.39 g | 196.69 d | 0.0 c | 0.0 d | 0.0 d | 0.0 c | 0.0 c |
| Hamadan | 6.57 e | 62.61 c | 5.25 e | 107.36 e | 0.0 c | 0.0 d | 5.12 a | 0.0 c | 0.88 b |

***p*-cou:** Para-coumaric acid; **Her:** Herniarin; **Cou:** Coumarin; **Lut:** Luteolin; **Api:** Apigenin; **Chi:** Chicoric acid; **Gall:** Gallic acid; **Nar:** Naringenin; **Que:**

Quercetin

*Mean comparison was performed by LSD method at 5% probability. Columns with similar letters did not differ significantly.

Table S6. The mean Comparison of interaction effects of water deficit and tarragon accessions on phytochemical traits

| Phytochemical traits | | | | | | | | | |
|------------------------|-------------|------------|-----------|-----------|-----------|-----------|-----------|----------|----------|
| 100% of Field capacity | | | | | | | | | |
| Accessions | DPPH (IC50) | FRAP | Phe | Fla | Chlo | Fer | Caf | Van | Syr |
| Isfahan | 0.078 f-i | 496.01 pq | 52.69 i-n | 31.72 i-m | 19.62 i-l | 19 d | 12.9 k-n | 10.88 g | 11.69 k |
| Abadeh | 0.109 a | 595.94 h-m | 35.64 o | 21.15 n | 37.2 ab | 0 r | 20.39 de | 4.094 j | 12.14 k |
| Semirom | 0.081 fg | 539.84 m-p | 53.16 i-n | 32.12 i-m | 34.32 bc | 0.523 pq | 16.28 ghi | 23.22 b | 0.288 o |
| Neishabour | 0.078 f-j | 587.24 i-n | 54.14 h-n | 35.23 g-m | 24.44 fgh | 0.668 op | 13.74 klm | 4.41 j | 11.42 k |
| Zarand | 0.072 g-l | 603.75 h-m | 43.98 no | 28.95 lmn | 27.76 def | 2.457 ij | 13.61 klm | 20.17 c | 7.185 lm |
| Estahbanat | 0.086 def | 702.98 a-e | 57.74 e-k | 37.16 e-l | 38.48 a | 2.031 jk | 8.94 pqr | 26.71 a | 5.146 n |
| Anonymous | 0.084 efg | 586.59 i-n | 56.65 f-k | 35.03 g-m | 22.7 ghi | 0.406 pqr | 10.03 o-r | 0.762 lm | 7.994 l |
| Birjand | 0.048 a-d | 679.55 a-g | 68.24 b-e | 44.73 a-e | 17.3 klm | 0 r | 11.81 mno | 0 m | 7.914 l |
| Kermanshah | 0.096 bcd | 502.34 opq | 45.34 l-o | 28.98 lmn | 12.8 nop | 0 r | 22.12 bcd | 0 m | 13.64 ij |
| Varamin | 0.111 a | 383.09 r | 46.94 k-n | 29.44 klm | 4.9 r | 104.2 a | 4 s | 0 m | 47.85 c |
| Yazd | 0.080 f-i | 562.06 l-o | 52.61 i-n | 29.32 lmn | 17.3 klm | 0.257 pqr | 8 r | 0 m | 11.8 k |
| Hamadan | 0.064 k-n | 659.61 b-h | 66.85 b-g | 43.59 a-f | 33.77 bc | 0 r | 25.39 a | 19.87 cd | 7.435 lm |
| 80% of Field capacity | | | | | | | | | |
| Isfahan | 0.069 h-l | 501.62 opq | 55.35 h-m | 35.61 f-m | 16.55 lmn | 17.81 e | 12.53 lmn | 8.793 i | 12.2 jk |
| Abadeh | 0.105 ab | 654.05 c-h | 52.51 i-n | 32.57 i-m | 23.02 ghi | 0.425 pqr | 14.78 ijk | 1.46 kl | 17.76 g |
| Semirom | 0.068 i-l | 580.02 j-n | 53.19 i-n | 27.55 mn | 21.49 hij | 0 r | 18.32 efg | 16.05 e | 0 o |
| Neishabour | 0.065 k-m | 603.06 h-m | 55.83 g-l | 33.49 h-m | 21.18 h-k | 1.132 mn | 14.02 jkl | 0 m | 16.18 h |
| Zarand | 0.063 k-m | 694.58 a-f | 47.31 k-n | 30.73 j-m | 18.94 i-m | 1.04 no | 11.01 nop | 14.4 f | 14.22 i |
| Estahbanat | 0.077 f-j | 716.54 abc | 63.44 c-i | 43.88 a-e | 27.13 ef | 1.94 kl | 16.05 hij | 1.746 k | 20.29 f |
| Anonymous | 0.073 g-k | 645.58 d-i | 64.37 c-h | 38.08 e-j | 30.76 cde | 3.001 h | 17.69 fgh | 2.04 k | 23.18 e |

| | | | | | | | | | |
|------------------------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|----------|----------|
| Birjand | 0.040 p | 722.21 ab | 68.95 a-d | 50.75 a | 30.57 cde | 0.219 pqr | 22.71 bc | 0 m | 17.66 g |
| Kermanshah | 0.085 def | 445.02 qr | 44.5 mno | 30.66 j-m | 9.54 pq | 0 r | 8.37 qr | 0 m | 10.89 k |
| Varamin | 0.102 abc | 400.39 r | 51.67 j-n | 31.03 j-m | 12.38 op | 56.76 c | 10.24 opq | 0 m | 72.86 a |
| Yazd | 0.069 h-l | 566.05 k-o | 56.4 g-k | 35.51 f-m | 25.86 fg | 1.515 lm | 17.7 fgh | 0 m | 12.k |
| Hamadan | 0.055 no | 690.98 a-f | 76.2 ab | 49.78 ab | 31.25 cd | 0 r | 24 ab | 19.18 d | 5.062 n |
| 60% of Field capacity | | | | | | | | | |
| Isfahan | 0.069 h-l | 530.8 nop | 60.25 d-j | 37.97 e-j | 11.57 op | 16.46 f | 8.91 pqr | 10 h | 16.88 gh |
| Abadeh | 0.093 cde | 603.55 h-m | 79.8 a | 50.07 ab | 18.25 j-m | 0 r | 14.57 i-l | 0 m | 13.87 i |
| Semirom | 0.062 k-n | 640.64 e-j | 52.22 j-n | 34.65 g-m | 14.98 mno | 0.595 op | 12.72 k-n | 11.12 g | 0 o |
| Neishabour | 0.061 lmn | 645.11 d-i | 60.14 d-j | 37.67 e-k | 31.62 cd | 0 r | 21.75 cd | 1.473 kl | 19.47 f |
| Zarand | 0.057 mno | 725.16 a | 54.81 h-n | 39.74 d-i | 11.69 op | 1.576 lm | 10.28 opq | 8.093 l | 6.065 mn |
| Estahbanat | 0.072 g-k | 652.93 c-h | 61.01 d-j | 41.4 c-h | 23.83 fgh | 3.98 g | 18.97 ef | 1.547 kl | 19.78 f |
| Anonymous | 0.067 j-m | 629.87 f-k | 54.75 h-n | 38.87 d-j | 24.52 fgh | 0.1 qr | 17.55 fgh | 1.823 k | 25.94 d |
| Birjand | 0.040 p | 725.96 a | 67.64 b-f | 46.57 a-d | 24.42 fgh | 0 r | 20.07 de | 0 m | 17.14 gh |
| Kermanshah | 0.080 fgh | 491 pq | 48.75 k-n | 33.96 g-m | 9.15 pq | 0 r | 8.27 qr | 0 m | 13.85 i |
| Varamin | 0.096 bcd | 423.29 r | 52.56 i-n | 32.84 i-m | 7.42 qr | 81.2 b | 5.63 s | 0 m | 59.57 b |
| Yazd | 0.064 k-m | 617.18 g-l | 65 c-h | 42.17 b-g | 20.51 h-l | 2.487 i | 13.48 klm | 0 m | 13.63 ij |
| Hamadan | 0.049 op | 707.53 a-d | 73.79 abc | 49.02 abc | 21.63 hij | 0.398 pqr | 14.21 i-l | 14.86 f | 5.208 n |

Phe: Phenol; **Fla:** Flavonoid; **Chlo:** Chlorogenic acid; **Fer:** Ferulic acid; **Caf:** Caffeic acid; **Van:** Vanillic acid; **Sy:** Syringic acid.

* and ** Significantly at the probability level of %5 and %1, respectively.

*Mean comparison was performed by LSD method at 5% probability. Columns with similar letters did not differ significantly.

Table S6 (continued). The mean Comparison of interaction effects of water deficit and tarragon accessions on phytochemical traits

| Phytochemical traits | | | | | | | | | |
|-------------------------------|---------------------|------------|------------|------------|------------|------------|-------------|------------|------------|
| 100% of Field capacity | | | | | | | | | |
| Accessions | <i>p</i>-cou | Her | Cou | Lut | Api | Chi | Gall | Nar | Que |
| Isfahan | 0p | 63.22 gh | 0 t | 83.45 n-q | 0.0 c | 0.0 g | 3.59 cd | 0.0 f | 2.41 cd |
| Abadeh | 0p | 18.03 t | 34.98 c | 51.37 tuv | 0.0 c | 0.0 g | 4.5 b | 0.0 f | 0.0 f |
| Semirom | 8.677 g | 21.54 qrs | 19.04 e | 53.33 stu | 0.31 c | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Neishabour | 0p | 21.54 qrs | 46.63 a | 214.8 g | 0.0 c | 0.0 g | 0.0 e | 7.9 a | 0.33 ef |
| Zarand | 8.436 gh | 18.23 st | 4.11 mn | 40.11 v | 0.23 c | 0.6 f | 3.99 bcd | 0.0 f | 0.0 f |
| Estahbanat | 19.1 d | 25.09 p | 0.815 rs | 47.6 uv | 0.0 c | 0.0 g | 0.0 e | 2.72 d | 0.0 f |
| Anonymous | 2.984 n | 40.12 mn | 5.53 k | 74.58 qr | 0.0 c | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Birjand | 1.659 o | 37.6 n | 2.47 p | 51.02 tuv | 0.0 c | 3.33 c | 0.0 e | 0.0 f | 2.03 d |
| Kermanshah | 33.29 a | 34.15 o | 42.22 b | 197.3 h | 0.0 c | 2.26 e | 0.0 e | 0.0 f | 0.0 f |
| Varamin | 18.45 d | 94.41 c | 0.92 r | 517.4 d | 0.0 c | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Yazd | 7.722 hi | 21.54 qrs | 3.65 no | 184.3 i | 0.0 c | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Hamadan | 6.37 jkl | 17.82 t | 8.43 i | 60.98 st | 0.0 c | 0.0 g | 4.37 b | 0.0 f | 0.12 ef |
| 80% of Field capacity | | | | | | | | | |
| Isfahan | 0p | 84.27 d | 0 t | 110.6 m | 0.0 c | 0.0 g | 3.5 cd | 0.0 f | 2.8 c |
| Abadeh | 0p | 19.39 rst | 12.53 h | 121.9 lm | 0.0 c | 0.0 g | 4.27 b | 0.0 f | 0.0 f |
| Semirom | 5.714 klm | 44.19 l | 3.97 mn | 82.44 opq | 1.39 b | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Neishabour | 0 p | 22.59 pqr | 13.29 g | 239.3 f | 0.0 c | 0.0 g | 0.0 e | 2.04 e | 0.76 e |
| Zarand | 8.12 gh | 32.21 o | 3.96 mn | 63.56 rs | 0.24 c | 0.0 g | 3.93 bcd | 0.0 f | 0.0 f |

| | | | | | | | | | |
|------------------------------|-----------|-----------|----------|-----------|--------|--------|---------|--------|---------|
| Estahbanat | 6.72 j | 55.29 j | 5 kl | 79.79 pq | 0.0 c | 0.0 g | 0.0 e | 4.42 b | 0.0 f |
| Anonymous | 7.69 hi | 39.51 mn | 4.44 lm | 87.79 nop | 0.0 c | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Birjand | 6.694 j | 61.78 hi | 7.93 i | 62 st | 0.0 c | 5.38 a | 0.0 e | 0.0 f | 3.76 b |
| Kermanshah | 27.25 b | 96.41 c | 20.4 d | 539.7 c | 0.0 c | 2.54 e | 0.0 e | 0.0 f | 0.0 f |
| Varamin | 33.12 a | 103.6 b | 1.33 qr | 603.6 b | 0.0 c | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Yazd | 10.02 f | 24.63 pq | 3.77 mno | 193.3 hi | 0.0 c | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Hamadan | 6.527 jk | 85.42 d | 6.42 j | 129.4 kl | 0.0 c | 0.0 g | 5.17 a | 0.0 f | 0.12 ef |
| 60% of Field capacity | | | | | | | | | |
| Isfahan | 0 p | 87.59 d | 0 t | 135.1 k | 0.0 c | 0.0 g | 4.04 bc | 0.0 f | 5.52 a |
| Abadeh | 0 p | 59.55 i | 16.62 f | 160 j | 0.0 c | 0.0 g | 4.46 b | 0.0 f | 0.0 f |
| Semirom | 5.487 lm | 70.26 f | 1.67 q | 79.66 pq | 2.89 a | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Neishabour | 0 p | 42.35 lm | 17.04 f | 263.5 e | 0.0 c | 0.0 g | 0.0 e | 2.26 e | 2.45 cd |
| Zarand | 6.145 j-m | 49.44 k | 3.11 op | 80.1 pq | 1.19 b | 0.0 g | 3.34 d | 0.0 f | 0.0 f |
| Estahbanat | 6.624 j | 62.63 ghi | 4.15 mn | 92.04 no | 0.0 c | 0.0 g | 0.0 e | 3.48 c | 6.01 a |
| Anonymous | 5.462 m | 77.04 e | 2.41 p | 96.63 n | 0.0 c | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Birjand | 5.547 lm | 65.76 g | 5.27 k | 94.2 n | 0.0 c | 3.98 b | 0.0 e | 0.0 f | 0.0 f |
| Kermanshah | 16.98 e | 104.2 b | 12.24 h | 658.6 a | 0.0 c | 2.93 d | 0.0 e | 0.0 f | 0.0 f |
| Varamin | 25.35 c | 124.6 a | 0.11 st | 653.5 a | 0.0 c | 0.49 f | 0.0 e | 0.0 f | 0.0 f |
| Yazd | 8.043 gh | 33.75 o | 2.75 p | 212.6 g | 0.0 c | 0.0 g | 0.0 e | 0.0 f | 0.0 f |
| Hamadan | 6.836 ij | 84.61 d | 0.93 r | 131.7 kl | 0.0 c | 0.0 g | 5.82 a | 0.0 f | 0.0 f |

p-cou: Para-coumaric acid; **Her:** Herniarin; **Cou:** Coumarin; **Lut:** Luteolin; **Api:** Apigenin; **Chi:** Chicoric acid; **Gall:** Gallic acid; **Nar:** Naringenin; **Que:**

Quercetin

*Mean comparison was performed by LSD method at 5% probability. Columns with similar letters did not differ significantly.

Table S7. Coefficients between phytochemical traits in tarragon accessions.

| | Phe | Fla | FRAP | IC₅₀ | Chlo | Syr | Fer | Van | Caf | <i>p</i> -cou | Her | Cou | Lut |
|------------------------|------------|------------|-------------|------------------------|-------------|------------|------------|------------|------------|---------------|------------|------------|------------|
| Phe | 1 | | | | | | | | | | | | |
| Fla | 0.953** | 1 | | | | | | | | | | | |
| FRAP | 0.645* | 0.709** | 1 | | | | | | | | | | |
| IC₅₀ | -0.607* | -0.673* | -0.667* | 1 | | | | | | | | | |
| Chlo | 0.685* | 0.62* | 0.868** | -0.435 | 1 | | | | | | | | |
| Syr | -0.251 | -0.259 | -0.624* | 0.562 | -0.556 | 1 | | | | | | | |
| Fer | -0.29 | -0.33 | -0.71** | 0.519* | -0.656* | 0.929** | 1 | | | | | | |
| Van | 0.187 | 0.163 | 0.365 | -0.342 | 0.334 | -0.505 | -0.233 | 1 | | | | | |
| Caf | 0.749** | 0.719** | 0.752** | -0.567 | 0.807** | -0.672* | -0.726** | 0.285 | 1 | | | | |
| <i>p</i> -cou | -0.46 | -0.346 | -0.603* | 0.438 | -0.699* | 0.551 | 0.549 | -0.255 | -0.554 | 1 | | | |
| Her | -0.155 | -0.113 | -0.681* | 0.321 | -0.694* | 0.646* | 0.749** | -0.104 | -0.485 | 0.652* | 1 | | |
| Cou | -0.274 | -0.257 | 0.072 | 0.259 | 0.023 | 0.204 | -0.347 | -0.327 | 0.273 | -0.005 | -0.271 | 1 | |
| Lut | -0.499 | -0.478 | -0.831** | 0.586* | -0.791** | 0.739** | 0.709** | -0.509* | -0.606* | 0.816** | 0.655* | 0.241 | 1 |

Phe: Phenol; **Fla:** Flavonoid; **IC₅₀:** DDPH; **Chlo:** Chlorogenic acid; **Sy:** Syringic acid; **Fer:** Ferulic acid; **Van:** Vanillic acid; **Caf:** Caffeic acid;

p-cou: *p*-coumaric acid; **Her:** Herniarin; **Cou:** Coumarin;

* and ** Significantly at the probability level of %5 and %1, respectively.

Table S8. Soil characteristics

| No | Soil properties | Unit | No | Soil properties | Unit |
|-----------|--------------------------------|-------------|-----------|------------------------|-------------|
| 1 | Total nitrogen (%) | 0.09 | 7 | Sand (%) | 22.6 |
| 2 | Exchangeable Potassium (ppm) | 696.0 | 8 | Clay (%) | 46.2 |
| 3 | Available Phosphorus (ppm) | 104.0 | 9 | Silt (%) | 31.2 |
| 4 | Organic matter (gr/kg) | 6.25 | 10 | Calcium carbonate (%) | 5.9 |
| 5 | Acidity (pH) | 6.8 | 11 | Calcium (ppm) | 400 |
| 6 | Electrical conductivity (dS/m) | 1.26 | 12 | Organic carbon (%) | 0.93 |

Table S9. Climatic conditions of tarragon cultivation area.

| Parameters | Average minimum temperature (°C) | Average maximum temperature (°C) | Average monthly temperature (°C) | Average monthly rainfall (mm) | Average percentage of relative humidity | Average minimum temperature (°C) | Average maximum temperature (°C) | Average monthly temperature (°C) | Average monthly rainfall (mm) | Average percentage of relative humidity |
|-------------------|----------------------------------|----------------------------------|----------------------------------|-------------------------------|-----------------------------------------|----------------------------------|----------------------------------|----------------------------------|-------------------------------|-----------------------------------------|
| | April | | | | | May | | | | |
| | 9.06 | 22.27 | 16.01 | 0.69 | 49.77 | 14.59 | 28.85 | 21.68 | 0.41 | 36.94 |
| | June | | | | | July | | | | |
| | 18.37 | 34.9 | 26.96 | 0.17 | 29.9 | 21 | 36.9 | 28.80 | 0.25 | 30.33 |
| | August | | | | | September | | | | |
| | 20.33 | 35.17 | 27.68 | 0 | 28.56 | 16.50 | 31.00 | 23.82 | 0.09 | 33.45 |