

Supplementary Material

مواد تکمیلی

جدول تکمیلی ۱. شاخص‌های تحمل تنش به همراه عملکرد دانه در شرایط بهینه و تنش کمبود روی در ژنوتیپ‌های ذرت

Supplementary Table 1. Stress tolerance indices with grain yield in maize genotypes under normal and zinc deficiency stress conditions

لاین Line	Yp (gr pl ⁻¹)	Ys (gr pl ⁻¹)	TOL	MP	GMP	STI	ATI	SSI	DI	HM	MpSTI	MsSTI
Ma001	(58) 69.8	(69) 47.4	(60) 22.3	(64) 58.6	(64) 57.5	(64) 0.5	(53) 1020.4	(62) 1.5	(70) 0.5	(62) 56.5	(60) 0.4	(67) 0.3
Ma002	(47) 77.7	(41) 63.2	(48) 14.5	(41) 70.4	(41) 70.1	(41) 0.8	(50) 806.7	(49) 0.8	(47) 0.8	(39) 69.7	(43) 0.8	(41) 0.8
Ma003	(53) 74.4	(37) 67.0	(39) 7.3	(39) 70.7	(39) 70.6	(39) 0.8	(42) 413.1	(37) 0.4	(37) 0.9	(35) 70.5	(47) 0.7	(34) 0.9
Ma004	(72) 53.1	(20) 77.9	(5) -24.8	(50) 65.5	(50) 64.3	(50) 0.6	(7) -1264.4	(6) -2.2	(7) 1.8	(51) 63.1	(69) 0.3	(30) 1
Ma005	(71) 54.5	(58) 55.3	(29) -0.8	(70) 54.9	(70) 54.9	(70) 0.5	(29) -38.3	(29) -0.07	(43) 0.9	(66) 54.9	(72) 0.2	(63) 0.4
Ma006	(50) 74.9	(24) 73.3	(32) 1.6	(34) 74.1	(34) 74.1	(34) 0.9	(32) 94	(32) 0.1	(26) 1.1	(29) 74.1	(41) 0.8	(25) 1.3
Ma007	(52) 74.6	(65) 49.9	(63) 24.7	(57) 62.2	(57) 61.0	(57) 0.6	(58) 1199.2	(66) 1.5	(69) 0.5	(55) 59.8	(53) 0.5	(62) 0.4
Ma008	(39) 81.4	(72) 46.0	(71) 35.4	(56) 63.7	(56) 61.2	(56) 0.6	(68) 1717.3	(76) 2	(78) 0.4	(56) 58.8	(49) 0.6	(65) 0.3
Ma009	(79) 48.8	(79) 39.6	(41) 9.2	(82) 44.2	(82) 44.0	(82) 0.3	(40) 322.5	(50) 0.9	(71) 0.5	(79) 43.7	(81) 0.1	(81) 0.1
Ma010	(45) 79.6	(40) 63.3	(53) 16.3	(37) 71.4	(37) 71.0	(37) 0.8	(52) 919.9	(51) 0.9	(49) 0.8	(36) 70.5	(39) 0.8	(38) 0.8
Ma011	(73) 52.3	(44) 61.4	(18) -9.1	(67) 56.8	(67) 56.6	(67) 0.5	(17) -410.6	(19) -0.8	(25) 1.1	(63) 56.5	(73) 0.2	(54) 0.5
Ma012	(43) 80.8	(29) 70.0	(44) 10.7	(32) 75.4	(32) 75.2	(32) 0.9	(47) 641.9	(41) 0.6	(36) 0.9	(26) 75	(36) 1	(29) 1.2
Ma013	(51) 74.9	(64) 50.6	(62) 24.3	(55) 62.7	(55) 61.5	(55) 0.6	(57) 1187.0	(63) 1.5	(68) 0.5	(53) 60.4	(52) 0.5	(61) 0.4
Ma014	(81) 46.6	(63) 50.9	(24) -4.3	(78) 48.7	(78) 48.7	(78) 0.3	(24) -167.1	(22) -0.4	(45) 0.9	(76) 48.6	(78) 0.1	(71) 0.2
Ma015	(29) 93.8	(11) 91.0	(33) 2.8	(12) 92.4	(12) 92.4	(12) 1.4	(37) 207.2	(33) 0.1	(15) 1.4	(11) 92.4	(16) 2	(10) 3.1
Ma016	(83) 45.8	(60) 53.1	(20) -7.2	(77) 49.4	(77) 49.3	(77) 0.4	(22) -284.7	(20) -0.7	(33) 1	(75) 49.2	(79) 0.1	(69) 0.3
Ma017	(15) 107.3	(10) 91.3	(51) 15.9	(6) 99.3	(6) 99.0	(6) 1.6	(61) 1254.6	(43) 0.7	(21) 1.2	(5) 98.7	(7) 3	(9) 3.6
Ma018	(28) 95.5	(31) 69.2	(64) 26.3	(21) 82.3	(21) 81.3	(21) 1.1	(67) 1699.2	(59) 1.3	(51) 0.8	(21) 80.2	(23) 1.6	(22) 1.4
Ma019	(57) 70.2	(36) 67.1	(34) 3.0	(45) 68.7	(45) 68.6	(45) 0.7	(33) 165.4	(34) 0.2	(31) 1	(41) 68.6	(50) 0.6	(36) 0.9
Ma020	(69) 55.2	(53) 58.0	(26) -2.8	(68) 56.6	(68) 56.6	(68) 0.5	(25) -126.5	(25) -0.2	(34) 0.9	(60) 56.6	(70) 0.2	(58) 0.4
Ma021	(18) 104.4	(43) 61.6	(76) 42.8	(24) 83.0	(24) 80.2	(24) 1.0	(78) 2722.2	(71) 1.9	(63) 0.5	(24) 77.5	(21) 1.9	(33) 1.09
Ma022	(25) 97.2	(21) 76.8	(58) 20.3	(18) 87.0	(18) 86.4	(18) 1.2	(62) 1394.8	(53) 1	(35) 0.9	(17) 85.8	(20) 1.9	(17) 1.9
Ma023	(34) 88.2	(87) 28.3	(86) 59.9	(76) 58.3	(76) 50.0	(76) 0.4	(73) 2375.7	(91) 3.2	(90) 0.1	(80) 42.9	(58) 0.5	(87) 0.08
Ma024	(48) 77.2	(39) 63.4	(46) 13.8	(42) 70.3	(42) 70.0	(42) 0.8	(48) 765.5	(46) 0.8	(46) 0.8	(40) 69.6	(44) 0.8	(40) 0.8
Ma025	(20) 102.3	(59) 55.2	(80) 47.1	(33) 78.7	(33) 75.1	(33) 0.9	(80) 2804.5	(78) 2.2	(72) 0.4	(34) 71.7	(24) 1.6	(48) 0.7
Ma026	(63) 63.5	(47) 60.0	(35) 3.4	(54) 61.8	(54) 61.7	(54) 0.6	(34) 168.4	(35) 0.2	(42) 0.9	(52) 61.7	(61) 0.4	(52) 0.6
Ma027	(80) 48.3	(27) 72.9	(6) -24.6	(59) 60.6	(59) 59.3	(59) 0.5	(8) -1158.2	(3) -2.4	(8) 1.7	(58) 58.1	(75) 0.2	(47) 0.8
Ma028	(74) 51.7	(35) 67.3	(11) -15.5	(60) 59.5	(60) 59.0	(60) 0.5	(11) -727.1	(10) -1.4	(16) 1.4	(57) 58.5	(71) 0.2	(50) 0.7
Ma030	(54) 73.8	(4) 103.7	(2) -29.9	(17) 88.8	(17) 87.5	(17) 1.2	(1) -2078.1	(7) -1.9	(1) 2.3	(16) 86.2	(33) 1.1	(8) 3.6
Ma031	(4) 121.9	(48) 58.9	(87) 62.9	(19) 90.4	(19) 84.8	(19) 1.2	(91) 4231.6	(81) 2.4	(75) 0.4	(23) 79.5	(9) 2.9	(31) 1.1
Ma032	(56) 72.7	(25) 73	(30) -0.3	(36) 72.8	(36) 72.8	(36) 0.8	(30) -17.3	(30) -0.02	(23) 1.1	(33) 72.8	(45) 0.7	(27) 1.2
Ma033	(8) 119	(73) 45.1	(90) 73.9	(35) 82.0	(35) 73.2	(35) 0.8	(93) 4289.8	(88) 2.9	(85) 0.2	(49) 65.4	(15) 2	(57) 0.4
Ma034	(14) 107.9	(38) 63.6	(77) 44.3	(20) 85.7	(20) 82.8	(20) 1.1	(82) 2911.8	(73) 1.9	(61) 0.6	(22) 80	(13) 2.2	(28) 1.2
Ma035	(2) 127.3	(18) 80.5	(79) 46.8	(4) 103.9	(4) 101.2	(4) 1.7	(89) 3753.9	(67) 1.7	(48) 0.8	(6) 98.6	(4) 4.6	(13) 2.9
Ma036	(55) 73.76	(78) 40.5	(70) 33.2	(71) 57.1	(71) 54.6	(71) 0.4	(64) 1440.4	(77) 2.1	(80) 0.3	(73) 52.2	(59) 0.4	(77) 0.2
Ma037	(17) 105	(88) 26.8	(93) 78.1	(74) 65.9	(74) 53.1	(74) 0.4	(84) 3288.5	(92) 3.5	(91) 0.1	(81) 42.8	(40) 0.8	(86) 0.09

لاین Line	Yp (gr pl ⁻¹)	Ys (gr pl ⁻¹)	TOL	MP	GMP	STI	ATI	SSI	DI	HM	MpSTI	MsSTI
Ma038	(70) 54.9	(15) 82.3	(4) -27.4	(48) 68.6	(48) 67.2	(48) 0.7	(5) -1460.9	(4) -2.4	(6) 2	(47) 65.9	(68) 0.3	(23) 1.3
Ma039	(84) 43.9	(86) 34.1	(42) 9.8	(87) 39.0	(87) 38.7	(87) 0.2	(38) 302.3	(55) 1	(76) 0.4	(86) 38.4	(84) 0.08	(88) 0.07
Ma040	(44) 80.3	(51) 58.1	(59) 22.1	(46) 69.2	(46) 68.3	(46) 0.7	(59) 1199.3	(58) 1.3	(56) 0.6	(45) 67.4	(42) 0.8	(49) 0.7
Ma042	(42) 81.1	(42) 61.7	(57) 19.3	(38) 71.4	(38) 70.8	(38) 0.8	(56) 1086.9	(56) 1.1	(53) 0.7	(37) 70.1	(38) 0.9	(47) 0.8
Ma043	(93) 19.8	(90) 26.0	(22) -6.2	(92) 22.9	(92) 22.7	(92) 0.08	(26) -112.4	(9) -1.5	(66) 0.5	(92) 22.4	(92) 0	(92) 0.01
Ma044	(26) 97	(45) 60.1	(72) 36.8	(28) 78.5	(28) 76.4	(28) 0.9	(72) 2228.6	(69) 1.8	(62) 0.6	(28) 74.2	(29) 1.5	(37) 0.9
Ma045	(64) 63.2	(19) 78.3	(12) -15.0	(40) 70.7	(40) 70.3	(40) 0.8	(10) -840.5	(16) -1.1	(12) 1.5	(38) 69.9	(57) 0.5	(24) 1.3
Ma046	(60) 66.9	(66) 48.3	(56) 18.6	(66) 57.6	(66) 56.8	(66) 0.5	(51) 838.9	(60) 1.3	(64) 0.5	(64) 56.1	(66) 0.4	(66) 0.3
Ma048	(85) 39.7	(77) 41.2	(28) -1.5	(86) 40.4	(86) 40.4	(86) 0.2	(28) -50.0	(26) -0.1	(55) 0.6	(85) 40.4	(86) 0.07	(83) 0.1
Ma049	(9) 115.5	(14) 83.3	(69) 32.2	(8) 99.4	(8) 98.1	(8) 1.6	(76) 2506.0	(61) 1.3	(38) 0.9	(8) 96.8	(6) 3.5	(12) 2.9
Ma050	(23) 98.3	(52) 58.1	(73) 40.2	(31) 78.2	(31) 75.6	(31) 0.9	(75) 2412.2	(70) 1.9	(65) 0.5	(32) 73	(28) 1.5	(44) 0.8
Ma051	(76) 51.1	(85) 34.4	(55) 16.7	(84) 42.8	(84) 41.9	(84) 0.2	(44) 558.0	(65) 1.5	(79) 0.3	(83) 41.1	(82) 0.1	(85) 0.09
Ma052	(82) 46.5	(70) 46.1	(31) 0.3	(81) 46.3	(81) 46.3	(81) 0.3	(31) 13.5	(31) 0.03	(54) 0.7	(77) 46.3	(80) 0.1	(79) 0.2
Ma053	(41) 81.2	(28) 71.3	(43) 9.8	(29) 76.2	(29) 76.1	(29) 0.9	(45) 594.0	(39) 0.5	(32) 1	(25) 75.9	(35) 1	(26) 1.3
Ma054	(27) 96.1	(17) 81.3	(49) 14.8	(15) 88.7	(15) 88.4	(15) 1.3	(55) 1042.6	(44) 0.7	(30) 1.1	(15) 88.1	(19) 2	(16) 2.3
Ma055	(36) 86.2	(9) 92.1	(23) -5.9	(14) 89.1	(14) 89.1	(14) 1.3	(16) -419.4	(24) -0.3	(10) 1.6	(14) 89	(25) 1.6	(11) 3
Ma057	(31) 89.9	(82) 38.2	(84) 51.7	(61) 64.1	(61) 58.6	(61) 0.5	(74) 2405.3	(84) 2.7	(86) 0.2	(71) 53.6	(46) 0.7	(75) 0.2
Ma060	(78) 49.5	(46) 60.1	(13) -10.5	(72) 54.8	(72) 54.6	(72) 0.4	(14) -457.3	(17) -1	(24) 1.1	(67) 54.3	(76) 0.2	(59) 0.4
Ma062	(37) 84	(55) 56.5	(65) 27.4	(43) 70.2	(43) 68.9	(43) 0.7	(66) 1499.1	(64) 1.5	(60) 0.6	(44) 67.5	(37) 0.9	(53) 0.6
Ma064	(19) 103.4	(8) 96.9	(36) 6.5	(5) 100.1	(5) 100.1	(5) 1.6	(43) 518.0	(36) 0.3	(14) 1.4	(4) 100	(8) 2.9	(6) 4
Ma065	(75) 51.2	(92) 21.7	(66) 29.4	(90) 36.4	(90) 33.3	(90) 0.1	(49) 779.8	(85) 2.7	(89) 0.1	(90) 30.5	(83) 0.08	(91) 0.02
Ma066	(88) 33.9	(75) 43.5	(15) -9.6	(88) 38.7	(88) 38.4	(88) 0.2	(21) -292.1	(13) -1.3	(44) 0.9	(88) 38.1	(89) 0.04	(82) 0.1
Ma072	(33) 88.6	(1) 110.1	(8) -21.5	(7) 99.4	(7) 98.8	(7) 1.6	(3) -1686.2	(15) -1.1	(3) 2.2	(7) 98.2	(14) 2.1	(4) 5.2
Ma073	(24) 98.1	(91) 23.6	(91) 74.4	(80) 60.9	(80) 48.2	(80) 0.3	(81) 2845.3	(93) 3.6	(92) 0.09	(87) 38.1	(51) 0.6	(89) 0.05
Ma074	(35) 86.8	(80) 39.3	(82) 47.5	(63) 63.1	(63) 58.4	(63) 0.5	(71) 2202.0	(83) 2.6	(84) 0.2	(68) 54.1	(48) 0.7	(74) 0.2
Ma075	(59) 67	(32) 68.9	(27) -1.9	(47) 67.9	(47) 67.9	(47) 0.7	(27) -105.5	(28) -0.1	(27) 1.1	(43) 67.9	(54) 0.5	(35) 0.9
Ma076	(10) 114.7	(34) 67.6	(81) 47.1	(16) 91.2	(16) 88.1	(16) 1.2	(85) 3291.6	(72) 1.9	(59) 0.6	(18) 85.1	(10) 2.8	(19) 1.5
Ma077	(16) 106.6	(57) 56.3	(83) 50.3	(26) 81.4	(26) 77.5	(26) 1.0	(83) 3090.4	(79) 2.2	(73) 0.4	(31) 73.7	(22) 1.9	(46) 0.8
Ma079	(12) 109.3	(56) 56.3	(85) 52.9	(25) 82.8	(25) 78.5	(25) 1.0	(86) 3291.7	(80) 2.3	(74) 0.4	(27) 74.3	(18) 2	(42) 0.8
Ma080	(22) 99.9	(50) 58.5	(74) 41.4	(27) 79.2	(27) 76.4	(27) 0.9	(77) 2509.6	(74) 1.9	(67) 0.5	(30) 73.8	(26) 1.6	(39) 0.8
Ma083	(66) 57.9	(23) 75.2	(9) -17.3	(49) 66.6	(49) 66.0	(49) 0.7	(9) -906.5	(11) -1.4	(11) 1.5	(48) 65.4	(64) 0.4	(3) 1.1
Ma085	(86) 36.8	(71) 46.1	(16) -9.3	(85) 41.4	(85) 41.2	(85) 0.2	(20) -304.6	(14) -1.2	(40) 0.9	(84) 40.9	(88) 0.06	(80) 0.1
Ma089	(11) 111.7	(83) 36.7	(92) 75.0	(52) 74.2	(52) 64.0	(52) 0.6	(90) 3811.1	(90) 3.2	(87) 0.1	(65) 55.3	(31) 1.41	(72) 0.2
Ma091	(65) 60.1	(33) 68.6	(19) -8.4	(51) 64.4	(51) 64.2	(51) 0.6	(15) -430.3	(21) -0.6	(19) 1.2	(50) 64.1	(62) 0.4	(43) 0.8
Ma096	(6) 120.8	(22) 75.5	(78) 45.2	(9) 98.1	(9) 95.5	(9) 1.5	(87) 3427.8	(68) 1.8	(52) 0.7	(10) 92.9	(5) 3.7	(14) 2.3
Ma098	(21) 100.3	(13) 83.5	(54) 16.7	(13) 91.9	(13) 91.5	(13) 1.4	(60) 1217.1	(45) 0.8	(29) 1.1	(13) 91.2	(11) 2.3	(14) 26
Ma100	(92) 23.7	(93) 9.7	(47) 14.0	(93) 16.7	(93) 15.1	(93) 0.0	(35) 168.9	(86) 2.8	(93) 0.06	(93) 13.7	(93) 0	(93) 0
Ma104	(5) 121.0	(3) 105.1	(50) 15.91	(2) 113.1	(2) 112.8	(2) 2.1	(63) 1422.3	(40) 0.6	(13) 1.4	(1) 112.5	(3) 5.2	(1) 6
Ma105	(68) 55.4	(12) 85.3	(3) -29.8	(44) 70.3	(44) 68.7	(44) 0.7	(4) -1626.6	(2) -2.5	(5) 2.1	(46) 67.2	(65) 0.4	(21) 1.5
Ma106	(87) 35.8	(61) 52.9	(10) -17.1	(83) 44.3	(83) 43.5	(83) 0.3	(12) -589.6	(5) -2.3	(20) 1.2	(82) 42.7	(87) 0.06	(73) 0.2
Ma107	(30) 91.2	(7) 97.7	(21) -6.4	(10) 94.4	(10) 94.4	(10) 1.4	(13) -484.8	(23) -0.3	(9) 1.7	(9) 94.3	(17) 2	(7) 3.7

لاین Line	Yp (gr pl ⁻¹)	Ys (gr pl ⁻¹)	TOL	MP	GMP	STI	ATI	SSI	DI	HM	MpSTI	MsSTI
Ma108	(46) 79	(16) 82.1	(25) -3.1	(23) 80.5	(23) 80.5	(23) 1.0	(23) -197.8	(27) -0.1	(17) 1.3	(19) 80.5	(34) 1.1	(18) 1.9
Ma109	(77) 49.6	(49) 58.8	(17) -9.2	(73) 54.2	(73) 54.0	(73) 0.4	(18) -395.9	(18) -0.8	(28) 1.1	(70) 53.8	(77) 0.2	(60) 0.4
Ma110	(67) 55.6	(67) 48.1	(40) 7.4	(75) 51.8	(75) 51.7	(75) 0.4	(39) 306.3	(42) 0.6	(57) 0.6	(74) 51.6	(74) 0.2	(70) 0.2
Ma111	(3) 124.8	(5) 102.2	(61) 22.5	(1) 113.5	(1) 112.9	(1) 2.1	(70) 2019.4	(47) 0.8	(18) 1.3	(2) 112.4	(2) 5.5	(2) 5.9
Ma112	(40) 81.2	(81) 38.6	(75) 42.5	(69) 59.9	(69) 56.0	(69) 0.5	(69) 1890.4	(82) 2.5	(83) 0.3	(72) 52.3	(55) 0.5	(78) 0.2
Ma113	(90) 33.3	(89) 26.1	(38) 7.2	(91) 29.7	(91) 29.5	(91) 0.1	(36) 169.6	(54) 1	(81) 0.3	(91) 29.3	(91) 0.02	(90) 0.02
Ma114	(1) 129.5	(6) 98.2	(67) 31.3	(3) 113.8	(3) 112.8	(3) 2.1	(79) 2800.6	(57) 1.1	(22) 1.2	(3) 111.7	(1) 5.9	(3) 5.2
Ma115	(89) 33.6	(30) 69.3	(1) -35.6	(79) 51.5	(79) 48.3	(79) 0.3	(6) -1365.3	(1) -5	(2) 2.3	(78) 45.3	(85) 0.07	(56) 0.4
Ma116	(61) 64.6	(62) 51.1	(45) 13.5	(65) 57.8	(65) 57.4	(65) 0.5	(46) 614.9	(52) 1	(58) 0.6	(59) 57	(67) 0.3	(64) 0.3
Ma117	(49) 76.7	(74) 44.8	(68) 31.9	(62) 60.7	(62) 58.6	(62) 0.5	(65) 1483.6	(75) 2	(77) 0.4	(61) 56.5	(56) 0.5	(68) 0.2
Ma118	(7) 119.2	(68) 48.0	(88) 71.1	(30) 83.6	(30) 75.6	(30) 0.9	(92) 4269.8	(87) 2.8	(82) 0.3	(42) 68.4	(12) 2.2	(53) 0.5
Ma119	(91) 32.7	(76) 43.3	(14) -10.5	(89) 38.0	(89) 37.7	(89) 0.2	(19) -315.4	(8) -1.5	(41) 0.9	(89) 37.3	(90) 0.04	(84) 0.1
Ma120	(32) 89.2	(25) 73	(52) 16.2	(22) 81.1	(22) 80.7	(22) 1.0	(54) 1039.3	(48) 0.8	(39) 0.9	(20) 80.3	(30) 1.4	(20) 1.5
Ma121	(13) 108.7	(84) 35.8	(89) 72.8	(53) 72.3	(53) 62.4	(53) 0.6	(88) 3608.8	(89) 3.2	(90) 0.1	(69) 53.9	(32) 1.2	(76) 0.2
Ma122	(62) 63.9	(54) 56.6	(37) 7.2	(58) 60.2	(58) 60.1	(58) 0.6	(41) 345.6	(38) 0.5	(50) 0.8	(54) 60	(63) 0.4	(55) 0.5
Ma123	(38) 81.8	(2) 105.3	(7) -23.4	(11) 93.5	(11) 92.8	(11) 1.4	(2) -1724.4	(12) -1.3	(4) 2.1	(12) 92.1	(27) 1.6	(5) 4.2

اعداد داخل پرانتز، نشان دهنده رتبه‌بندی ژنوتیپ‌ها برای هر شاخص است. YP: عملکرد دانه در شرایط نرمال، YS: عملکرد دانه در شرایط تنش، SSI: شاخص حساسیت به تنش، TOL: شاخص تحمل، STI: شاخص تحمل به تنش، ATI: شاخص تحمل غیرزیستی، MP: شاخص میانگین بهره‌وری، GMP: شاخص میانگین همدسی بهره‌وری، DI: شاخص مقاومت به تنش خشکی، HM: شاخص میانگین هارمونیک، MpSTI: شاخص تحمل به تنش تغییر یافته در شرایط نرمال، MsSTI: شاخص تحمل به تنش تغییر یافته در شرایط تنش.

The numbers within the parentheses indicate the ranking of the genotypes for each index. YP: Optimal (potential) yield of a given genotype, YS: Stress yield of a given genotype, SSI: Stress susceptibility index, TOL: Tolerance, STI: Stress tolerance index, ATI: Abiotic tolerance index, MP: Mean productivity, GMP: Geometric mean productivity, DI: Drought resistance index, HM: Harmonic mean, MpSTI: Modified stress tolerance index in optimum irrigation, MsSTI: Modified stress tolerance index in moderate and severe stress.