**Green and efficient One-pot synthesis of 2,3-dihydroquinazolin-4(1*H*)-ones and their anthelmintic studies.**

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| **Table of Content** | **Page No** |
| 1. General procedure for the synthesis of 2,3-dihydroquinazolin-4(1H)-ones | 1 |
| 1. Analytical Data of the synthesized compounds | 2-7 |
| 1. **1H** and **13C** NMR Spectra of the compounds | 8-23 |
| 1. EDS Spectrum of Fe3O4@L-proline sulfonic acid | 24 |

**General procedure for the synthesis of 2,3-dihydroquinazolin-4(1*H*)-ones: (3a-p)**

In 10 mL of ethanol, a mixture of 2-aminobenzamide (1 mmol) and an aromatic aldehyde (1 mmol) were added in a round-bottom flask with 0.010 g of Fe3O4@*L*-proline sulfonic acid as a catalyst. The reaction mixture was stirred at 50 oC with an appropriate time and was monitored by thin-layer chromatography (TLC). When the reaction mixture was completed, the catalyst was recovered using an external magnet and then used for the next five runs. The product obtained was filtered and re-crystallized from hot ethanol.

**Analytical data:**

**2-phenyl-2,3-dihydroquinazolin-4(1*H*)-one: 3a**

White solid, melting point: 220-222 oC [Lit.[1] 217-219 oC]. FT-IR (KBr): νmax 3305, 3187, 3064, 1655, 1614, 1587, 1453 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  .30 (s, 1H), 7.60-7.23 (m, 7H), 7.12 (s, 1H), 6.72-6.68 (m, 2H), 5.74 (s, 1H). 13C-NMR (100 MHz, DMSO-*d6*):  163.57, 147.84, 141.54, 133.30, 128.43, 128.29, 127.32, 126.82, 117.04, 114.89, 114.35, 66.50. calc. MS (ESI) *m/z*: 224. Found MS (ESI) *m/z*: 225 [M+1]+.



**2-(4-hydroxyphenyl)-2,3-dihydroquinazolin-4(1*H*)-one: 3b**

White solid, melting point: 280-282 oC [Lit.[1] 278-280 oC]**.** FT-IR (KBr): νmax 3340, 3186, 3072, 1667, 1612, 1504, 1489 cm-1.  1H-NMR (400 MHz, DMSO-*d6*):  9.53 (s, 1H, OH), 8.11 (s, 1H), 7.59 (d, *J* = 7.8 Hz, 1H), 7.29(d, *J* = 8.4 Hz, 2H), 7.22 (t, *J* = 7.6 Hz, 1H), 6.95 (s, 1H), 6.75 (d, *J* = 8.8 Hz, 2H), 6.72 (d, *J* = 7.6 Hz, 1H), 6.66 (t, *J* = 7 Hz,1H), 5.64 (s, 1H). 13C-NMR (100 MHz, DMSO-*d6*): 163.74, 157.65, 148.13, 133.17, 131.51, 129.58, 128.27, 127.31, 117.00, 114.88, 114.33, 66.60. calc. MS (ESI) *m/z*: 240. Found MS (ESI) *m/z*: 241 [M+1]+.



**2-(4-bromophenyl)-2,3-dihydroquinazolin-4(1*H*)-one: 3c**

White solid, melting point: 200-201 oC [Lit.[2]197-199 oC]**.** FT-IR (KBr): νmax 3335, 3169, 3066, 1662, 1622, 1585, 1484 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  8.36 (s, 1H), 7.60-7.58 (m, 3H), 7.43 (d, *J* = 8.4 Hz, 2H), 7.24 (t, *J* = 7.6 Hz, 1H), 7.15 (s, 1H), 6.73 (d, *J* = 7.2 Hz, 1H), 6.67 (t, *J* = 7.6 Hz,1H), 5.74 (s, 1H). 13C-NMR (100 MHz, DMSO-*d6*):  163.46, 147.59, 141.02, 133.38, 131.19, 129.05, 127.32, 121.54, 117.25, 114.88, 114.42, 65.74. calc. MS (ESI) *m/z*: 302. Found MS (ESI) *m/z*: 303 [M]+, 305 [M+2]+.



**2-(4-fluorophenyl)-2,3-dihydroquinazolin-4(1*H*)-one: 3d**

White solid, melting point: 202-204 oC [Lit.[1]203-204 oC]. FT-IR (KBr): νmax 3326, 3178, 3068, 1655, 1627, 1508, 1447 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  8.31 (s, 1H), 7.60 (d, *J* = 8 Hz, 1H), 7.55-7.51 (m, 2H), 7.24-7.20 (m, 3H), 7.11 (s, 1H), 6.73 (d, *J* = 7.2 Hz, 1H), 6.67 (t, *J* = 8 Hz, 1H), 5.77 (s, 1H). 13C-NMR (100 MHz, DMSO-*d6*):  163.56, 163.28, 160.86, 147.77, 137.73, 133.33, 129.06, 127.33, 117.22, 115.17, 114.96, 114.89, 114.41, 65.89. calc. MS (ESI) *m/z*: 242. Found MS (ESI) *m/z*: 243 [M+1]+.



**2-(4-chlorophenyl)-2,3-dihydroquinazolin-4(1*H*)-one:** **3e**



White solid, melting point: 204-206 oC [Lit.[1]205-206 oC]. FT-IR (KBr): νmax 3341, 3172, 3067, 1663, 1623, 1590, 1565, 1488 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  8.34 (s, 1H), 7.60 (d, *J* = 8 Hz, 1H), 7.50 (d, *J* = 8.8 Hz, 2H), 7.45 (d, *J* = 9.2 Hz, 2H), 7.25 (t, *J* = 7.6 Hz, 1H), 7.15 (s, 1H), 6.74 (d, *J* = 8.4 Hz, 1H), 6.67 (t, *J* = 7.4 Hz, 1H), 5.76 (s, 1H). 13C-NMR (100 MHz, DMSO-*d6*):  163.99, 148.11, 141.10, 133.89, 133.45, 129.22, 128.78, 127.84, 117.77, 115.37, 114.93, 66.22. calc. MS (ESI) *m/z*: 258. Found MS (ESI) *m/z*: 259 [M+1]+ , 281 [M+Na]+.

**2-(4-ethoxyphenyl)-2,3-dihydroquinazolin-4(1*H*)-one: 3f**

White solid, melting point: 166-168 oC [Lit.[2] 164-165 oC]. FT-IR (KBr): νmax 3303, 3192, 3061, 1650, 1614, 1587, 1568, 1510, 1488 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  8.19 (s, 1H), 7.60 (d, *J* = 8 Hz,1H), 7.39 (d, *J* = 8.8 Hz, 2H), 7.22 (t, *J* = 8 Hz,1H), 7.01 (s, 1H), 6.92 (d, *J* = 9.2 Hz, 2H), 6.73 (d, *J* = 8 Hz,1H), 6.66 (t, *J* = 7.6 Hz,1H), 5.68 (s, 1H), 4.00 (q, 2H), 1.30 (t, *J* = 6.8 Hz, 3H). 13C-NMR (100 MHz, DMSO-*d6*): 163.71, 158.63, 147.96, 133.26, 129.44, 128.15, 127.31, 117.06, 114.89, 114.37, 114.05, 66.25, 63.02, 14.56. calc. MS (ESI) *m/z*: 268. Found MS (ESI) *m/z*: 269 [M+1]+.



**2-(p-tolyl)-2,3-dihydroquinazolin-4(1*H*)-one:** **3g**

White solid, melting point: 222-223 oC [Lit.[3]225-226 oC]**.** FT-IR (KBr): νmax 3313, 3196, 3063, 1658, 1611, 1510, 1486 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  8.25 (s, 1H), 7.59 (d, *J* = 8 Hz, 1H), 7.36 (d, *J* = 8.4 Hz, 2H), 7.23 (t, *J* = 7.6 Hz, 1H), 7.18 (d, *J* = 7.6 Hz, 2H), 7.06 (s, 1H), 6.72 (d, *J* = 7.6 Hz, 1H), 6.66 (t, *J* = 7.4 Hz, 1H), 5.70 (s, 1H), 2.28 (s, 3H). 13C-NMR (100 MHz, DMSO-*d6*):  163.63, 147.89, 138.59, 137.69, 134.55, 133.23, 128.77, 127.30, 126.76, 117.03, 114.94, 114.36, 66.33, 20.69. calc. MS (ESI) *m/z*: 238. Found MS (ESI) *m/z*: 239 [M+1]+.



**2-(4-methoxyphenyl)-2,3-dihydroquinazolin-4(1*H*)-one:** **3h**

White solid, melting point: 180-182 oC [Lit.[1]181-183 oC]. FT-IR (KBr): νmax 3323, 3156, 3021, 1666, 1588, 1464 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  8.18 (s, 1H), 7.60 (d, *J* = 8.4 Hz, 1H), 7.40 (d, *J* = 8.4 Hz, 2H), 7.23 (t, *J* = 8.6 Hz, 1H), 7.00 (s, 1H), 6.93 (d, *J* = 8.8 Hz, 2H), 6.70 (d, *J* = 8 Hz, 1H), 6.66 (t, *J* = 7.6 Hz, 1H), 5.69 (s, 1H), 3.74 (s, 3H). 13C-NMR (100 MHz, DMSO-*d6*):  163.68, 159.38, 147.98, 133.40, 133.20, 128.18, 127.31, 117.05, 114.95, 114.37, 113.58, 66.26, 55.12. calc. MS (ESI) *m/z*: 254. Found MS (ESI) *m/z*: 255 [M+1]+.



**2-(4-nitrophenyl)-2,3-dihydroquinazolin-4(1*H*)-one:** **3i**

Yellow solid, melting point: 203-204 oC [Lit.[4]205-207 oC]. FT-IR (KBr): νmax 3303, 3129, 3052, 2951, 1603, 1526, 1466 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  8.54 (s, 1H), 8.25 (d, *J* = 9.2 Hz, 2H), 7.73 (d, *J* = 8.4 Hz, 2H), 7.59 (d, *J* = 8 Hz, 1H), 7.34 (s, 1H), 7.26 (t, *J* = 7.6 Hz, 1H), 6.75 (d, *J* = 7.2 Hz, 1H), 6.68 (t, *J* = 8 Hz, 1H), 5.90 (s, 1H). 13C-NMR (100 MHz, DMSO-*d6*):  163.27, 149.26, 147.35, 147.20, 133.54, 127.99, 127.37, 123.55, 117.43, 114.84, 114.50, 65.22. calc. MS (ESI) *m/z*: 269. Found MS (ESI) *m/z*: 270 [M+1]+.



**2-(3-chlorophenyl)-2,3-dihydroquinazolin-4(1*H*)-one:** **3j**

White solid, melting point: 186-188 oC [Lit.[1]185-187 oC]. FT-IR (KBr): νmax 3323, 3144, 3075, 1658, 1590, 1475 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  8.40 (s, 1H), 7.59 (d, *J* = 7.6 Hz, 1H), 7.52 (s, 1H), 7.42 (d, *J* = 7.2 Hz, 3H), 7.27-7.21 (m, 2H), 6.75 (d, *J* = 8 Hz, 1H), 6.67 (t, *J* = 7.4 Hz, 1H), 5.77 (s, 1H). 13C-NMR (100 MHz, DMSO-*d6*):  163.41, 147.46, 144.33, 133.43, 132.94, 130.26, 128.23, 127.32, 126.71, 125.37, 117.29, 114.85, 114.43, 65.52. calc. MS (ESI) *m/z*: 258. Found MS (ESI) *m/z*: 259 [M+1]+, 281 [M+Na]+.



**2-(3-bromophenyl)-2,3-dihydroquinazolin-4(1*H*)-one:** **3k**

White solid, melting point: 192-194 oC [Lit.[5] 190 oC]**.** FT-IR (KBr): νmax 3286, 3189, 3060, 1662, 1614, 1513, 1473 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  8.25 (s, 1H), 7.51 (s, 1H), 7.45 (d, *J* = 8 Hz, 1H), 7.38 (d, *J* = 8 Hz, 1H), 7.33 (d, *J* = 8 Hz, 1H), 7.19 (t, *J* = 8 Hz, 1H), 7.10 (t, *J* = 7.6 Hz, 1H), 7.06 (s, 1H), 6.60 (d, *J* = 8 Hz, 1H), 6.52 (t, *J* = 7.6 Hz, 1H), 5.62 (s, 1H). 13C-NMR (100 MHz, DMSO-*d6*):  163.40, 147.45, 144.57, 133.44, 131.13, 130.55, 129.61, 127.34, 125.74, 121.56, 117.29, 114.84, 114.43, 65.48. calc. MS (ESI) *m/z*: 302. Found MS (ESI) *m/z*: 303 [M]+, 305 [M+2]+.



**2-(4-hydroxy-3-methoxyphenyl)-2,3-dihydroquinazolin-4(1*H*)-one:** **3l**

White solid, melting point: 220-222 oC [Lit.[6] 224-225 oC]**.** FT-IR (KBr): νmax 3382, 3232, 3073, 1650, 1627, 1587, 1568, 1519, 1484 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  9.08 (s, 1H, OH), 8.10 (s, 1H), 7.60 (d, *J* = 8 Hz, 1H), 7.24 (t, *J* = 6.8 Hz, 1H), 7.08 (s, 1H), 6.95 (s, 1H), 6.88 (d, *J* = 8.8 Hz, 1H), 6.76-6.73 (m, 2H), 6.67 (t, *J* = 7.4 Hz, 1H), 5.64 (s, 1H), 3.75 (s, 3H). 13C-NMR (100 MHz, DMSO-*d6*):  163.78, 148.15, 147.37, 146.85, 133.18, 131.86, 127.31, 119.60, 117.08, 114.97, 114.86, 114.38, 111.05, 66.79, 55.54. calc. MS (ESI) *m/z*: 270. Found MS (ESI) *m/z*: 271 [M+1]+.



**2-(2-chlorophenyl)-2,3-dihydroquinazolin-4(1*H*)-one: 3m**

White solid, melting point: 200-202 oC [Lit.[1]204-205 oC]**.** FT-IR (KBr): νmax 3363, 3194, 3057, 1647, 1618, 1503, 1385 cm-1. 1H-NMR (400 MHz, DMSO-*d6*):  8.23 (s, 1H), 7.66-7.63 (m, 2H), 7.50-7.47 (m, 1H), 7.41-7.37 (m, 2H), 7.25 (t, *J* = 7.6 Hz, 1H), 7.03 (s, 1H), 6.75 (d, *J* = 8.4 Hz, 1H), 6.71 (t, *J* = 7.6 Hz, 1H), 6.13 (s, 1H). 13C-NMR (100 MHz, DMSO-*d6*):  163.61, 147.62, 137.81, 133.41, 131.81, 130.26, 129.54, 128.70, 127.43, 127.34, 117.42, 114.63, 114.53, 63.65. calc. MS (ESI) *m/z*: 258. Found MS (ESI) *m/z*: 259 [M+1]+ , 281 [M+Na]+.



**2-(naphthalen-2-yl)-2,3-dihydroquinazolin-4(1*H*)-one: 3n**

White solid, melting point: 170-172 oC [Lit.[7] 167-169 oC]**.** FT-IR (KBr): νmax 3364, 3284, 3058, 1642, 1614, 1505, 1484, 1374 cm-1. 1H-NMR (400 MHz, DMSO-*d6*): 8.55 (d, *J* = 10 Hz, 1H), 8.31 (s,1H), 7.98 (t, *J* = 8.6 Hz, 2H), 7.69 (t, *J* = 6.6 Hz, 2H), 7.59-7.51 (m, 3H), 7.26 (t, *J* = 7.6 Hz, 1H), 7.11 (s, 1H), 6.76-6.71 (m, 2H), 6.49 (s,1H). 13C-NMR (100 MHz, DMSO-*d6*):  164.06, 148.44, 135.10, 133.74, 133.27, 130.50, 129.36, 128.57, 127.53, 126.08, 126.03, 125.80, 125.17, 124.59, 117.25, 114.96, 114.50, 65.94. calc. MS (ESI) *m/z*: 274. Found MS (ESI) *m/z*: 275 [M+1]+.



**2-(3,4-dimethoxyphenyl)-2,3-dihydroquinazolin-4(1*H*)-one: 3o**

White solid, melting point: 212-214 oC [Lit.[8] 209-210 oC]**.** FT-IR (KBr): νmax 3355, 3334, 3123, 3083, 1669, 1609, 1514, 1365 cm-1. 1H-NMR (400 MHz, DMSO-*d6*): (s, 1H) (d, *J* = 7.6 Hz, 1H), 7.28 (d, *J* = 8.8 Hz, 2H), 7.21 (t, *J* = 7.6 Hz, 1H), 6.91(s,1H), 6.70(d, *J* = 8.6 Hz, 2H), 6.64 (t, *J* = 8 Hz, 1H), 5.62 (s, 1H), 2.86 (s, 6H). 13C-NMR (100 MHz, DMSO-*d6*): 163.79, 150.64, 148.16, 133.09, 128.83, 128.57, 127.66, 127.28, 116.89, 114.97, 114.32, 111.88, 111.18, 66.57, 40.12. calc. MS (ESI) *m/z*: 284. Found MS (ESI) *m/z*: 285 [M+1]+.



**2-(4-(dimethylamino)phenyl)-2,3-dihydroquinazolin-4(1*H*)-one: 3p**

White solid, melting point: 206-208 oC [Lit.[1]208-210 oC]**.** FT-IR (KBr): νmax 3280, 3129, 2981, 1652, 1599, 1527, 1487 cm-1. 1H-NMR (400 MHz, DMSO-*d6*): 8.07 (s, 1H), 7.58 (d, *J* = 8 Hz, 1H), 7.28 (d, *J* = 8.4 Hz, 2H), 7.21 (t, *J* = 7.6 Hz, 1H), 6.91 (s, 1H), 6.71 (d, *J* = 7.6 Hz, 3H), 6.64 (t, *J* = 7.4 Hz, 1H), 5.61 (s, 1H), 2.86 (s, 6H). 13C-NMR (100 MHz, DMSO-*d6*): 163.81, 150.64, 148.18, 133.10, 128.56, 127.66, 127.29, 116.90, 114.97, 114.34, 111.88, 66.59, 40.10. calc. MS (ESI) *m/z*: 267. Found MS (ESI) *m/z*: 268 [M+1]+, 290 [M+Na]+.



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**Spectral data**

**1H NMR of 3a**





**13C NMR of 3a**





**1H NMR of 3b**





**13C NMR of 3b**





**1H NMR of 3c**





**13C NMR of 3c**





**1H NMR of 3d**





**13C NMR of 3d**





**1H NMR of 3e**





**13C NMR of 3e**





**1H NMR of 3f**





**13C NMR of 3f**





**1H NMR of 3g**





**13C NMR of 3g**





**1H NMR of 3h**





**13C NMR of 3h**





**1H NMR of 3i**





**13C NMR of 3i**





**1H NMR of 3j**





**13C NMR of 3j**





**1H NMR of 3k**





**13C NMR of 3k**





**1H NMR of 3l**





**13C NMR of 3l**





**1H NMR of 3m**





**13C NMR of 3m**





**1H NMR of 3n**





**13C NMR of 3n**





**1H NMR of 3o**





**13C NMR of 3o**





**1H NMR of 3p**

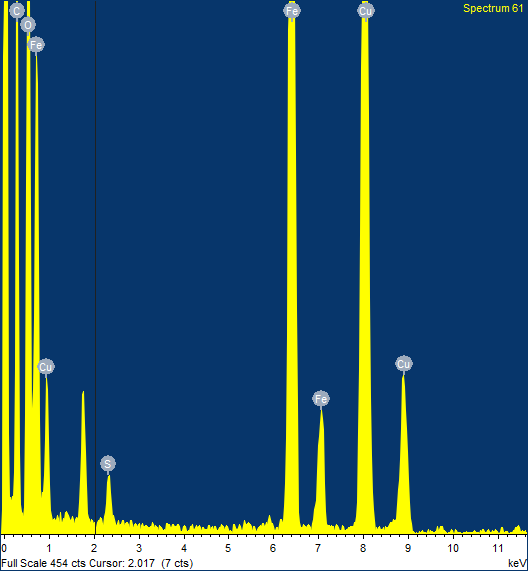




**13C NMR of 3p**







EDS Spectrum of Fe3O4@*L*-proline sulfonic acid