**Table S1** Haplotypes of *Haemonchus contortus COX1* sequences and accession numbers of isolates forming groups.

|  |  |  |
| --- | --- | --- |
|  | **No. of Isolate** | **Accession Numbers** |
| **Hap01** | **3** | OL435263-Nigeria OL435324-Nigeria OL435381-Nigeria |
| **Hap02** | **1** | OL435262-Nigeria |
| **Hap03** | **1** | MW051259-Iran |
| **Hap04** | **1** | MW051258-Iran |
| **Hap05** | **9** | KY678214-Turkey KY678213-Turkey KY678212-Turkey KY678211-Turkey KY678209-Turkey KY678207-Turkey KY678206-Turkey KJ188201-Turkey KJ188200-Turkey |
| **Hap06** | **1** | KY678210-Turkey |
| **Hap07** | **1** | KY678208-Turkey |
| **Hap08** | **1** | KX379142-Bulgaria |
| **Hap09** | **1** | KJ724438-Austria |
| **Hap10** | **1** | KJ724437-Austria |
| **Hap11** | **1** | KJ724436-Austria |
| **Hap12** | **1** | KJ724418-Austria |
| **Hap13** | **1** | KJ724417-Austria |
| **Hap14** | **1** | KJ724416-Austria |
| **Hap15** | **1** | KJ724415-Austria |
| **Hap16** | **1** | KJ724414-Austria |
| **Hap17** | **1** | KJ724413-Austria |
| **Hap18** | **1** | KJ724412-Austria |
| **Hap19** | **1** | KJ724411-Austria |
| **Hap20** | **1** | KJ724410-Austria |
| **Hap21** | **1** | KJ724409-Austria |
| **Hap22** | **1** | KJ724408-Austria |
| Hap23 | **1** | KJ724407-Austria |
| Hap24 | **1** | KJ724406-Austria |
| Hap25 | **1** | KJ724405-Austria |
| Hap26 | **1** | KJ724404-Austria |
| Hap27 | **1** | KJ724403-Austria |
| Hap28 | **1** | KJ724402-Austria |
| Hap29 | **1** | KJ724401-Austria |
| Hap30 | **1** | KJ724400-Austria |
| Hap31 | **1** | KJ724399-Austria |
| Hap32 | **1** | KJ724398-Austria |
| Hap33 | **1** | KJ724397-Austria |
| Hap34 | **1** | KJ724396-Austria |
| Hap35 | **1** | KJ724395-Austria |
| Hap36 | **1** | KJ724394-Austria |
| Hap37 | **1** | KJ724393-Austria |
| Hap38 | **2** | KJ724392-Austria KJ724391-Austria |
| Hap39 | **1** | KJ724390-Austria |
| Hap40 | **1** | KJ724389-Austria |
| Hap41 | **1** | KJ724388-Austria |
| Hap42 | **1** | KJ724387-Austria |
| Hap43 | **1** | KJ724386-Austria |
| Hap44 | **1** | KJ724385-Austria |
| Hap45 | **1** | KJ724384-Austria |
| Hap46 | **1** | KJ724383-Austria |
| Hap47 | **1** | KJ724382-Austria |
| Hap48 | **1** | KJ724381-Austria |
| Hap49 | **1** | KJ724380-Austria |
| Hap50 | **1** | KJ724379-Austria |
| Hap51 | **1** | KJ724378-Austria |
| Hap52 | **1** | KJ724377-Austria |
| Hap53 | **1** | KJ724376-Austria |
| Hap54 | **1** | KJ724375-Austria |
| Hap55 | **1** | KJ724374-Austria |
| Hap56 | **1** | KJ724373-Austria |
| Hap57 | **1** | KJ724372-Austria |
| Hap58 | **1** | KJ724371-Austria |
| Hap59 | **1** | KJ724370-Austria |
| Hap60 | **1** | KJ724369-Austria |
| Hap61 | **1** | KJ724368-Austria |
| Hap62 | **1** | KJ724367-Austria |
| Hap63 | **1** | KJ724366-Austria |
| Hap64 | **1** | KJ724365-Austria |
| Hap65 | **1** | KJ724364-Austria |
| Hap66 | **1** | KJ724363-Austria |
| Hap67 | **1** | KJ724362-Austria |
| Hap68 | **2** | KJ724361-Austria KJ724360-Austria |
| Hap69 | **1** | KJ724359-Austria |
| Hap70 | **1** | KJ724358-Austria |
| Hap71 | **1** | KJ724357-Austria |
| Hap72 | **1** | KJ724356-Austria |
| Hap73 | **1** | KJ724355-Austria |
| Hap74 | **1** | KJ724354-Austria |
| Hap75 | **2** | KJ724353-Austria KJ724352-Austria |
| Hap76 | **1** | KJ724351-Austria |
| Hap77 | **1** | KJ724350-Austria |
| Hap78 | **1** | KJ724349-Austria |
| Hap79 | **1** | KJ724348-Austria |
| Hap80 | **1** | KJ724347-Austria |
| Hap81 | **2** | KJ724346-Austria KJ724345-Austria |
| Hap82 | **1** | KJ188202-Turkey |
| Hap83 | **1** | OL435266-Nigeria |
| Hap84 | **1** | OL435265-Nigeria |
| Hap85 | **1** | OL435264-Nigeria |
| Hap86 | **1** | OL435263-Nigeria |
| Hap87 | **1** | OL435261-Nigeria |
| Hap88 | **1** | OL435260-Nigeria |
| Hap89 | **1** | OL435259-Nigeria |
| Hap90 | **1** | OL435258-Nigeria |
| Hap91 | **3** | OL435357-Nigeria OL435421-Nigeria OL435389-Nigeria |
| Hap92 | **2** | OL435356-Nigeria OL435456-Nigeria |
| Hap93 | **1** | OL435355-Nigeria |
| Hap94 | **1** | OL435354-Nigeria |
| Hap95 | **1** | OL435353-Nigeria |
| Hap96 | **8** | OL435352-Nigeria OL435452-Nigeria OL435437-Nigeria OL435436-Nigeria OL435424-Nigeria OL435413-Nigeria OL435526-Nigeria OL435509-Nigeria |
| Hap97 | **1** | OL435351-Nigeria |
| Hap98 | **1** | OL435350-Nigeria |
| Hap99 | **1** | OL435349-Nigeria |
| Hap100 | **1** | OL435348-Nigeria |
| Hap101 | **1** | OL435347-Nigeria |
| Hap102 | **1** | OL435346-Nigeria |
| Hap103 | **1** | OL435345-Nigeria |
| Hap104 | **2** | OL435344-Nigeria OL435293-Nigeria |
| Hap105 | **1** | OL435343-Nigeria |
| Hap106 | **1** | OL435342-Nigeria |
| Hap107 | **1** | OL435341-Nigeria |
| Hap108 | **1** | OL435340-Nigeria |
| Hap109 | **1** | OL435339-Nigeria |
| Hap110 | **1** | OL435338-Nigeria |
| Hap111 | **1** | OL435337-Nigeria |
| Hap112 | **1** | OL435336-Nigeria |
| Hap113 | **1** | OL435335-Nigeria |
| Hap114 | **1** | OL435334-Nigeria |
| Hap115 | **2** | OL435333-Nigeria OL435402-Nigeria |
| Hap116 | **1** | OL435332-Nigeria |
| Hap117 | **1** | OL435331-Nigeria |
| Hap118 | **2** | OL435330-Nigeria OL435422-Nigeria |
| Hap119 | **1** | OL435329-Nigeria |
| Hap120 | **1** | OL435328-Nigeria |
| Hap121 | **1** | OL435327-Nigeria |
| Hap122 | **1** | OL435326-Nigeria |
| Hap123 | **1** | OL435325-Nigeria |
| Hap124 | **1** | OL435323-Nigeria |
| Hap125 | **1** | OL435322-Nigeria |
| Hap126 | **1** | OL435321-Nigeria |
| Hap127 | **1** | OL435320-Nigeria |
| Hap128 | **1** | OL435319-Nigeria |
| Hap129 | **1** | OL435318-Nigeria |
| Hap130 | **1** | OL435317-Nigeria |
| Hap131 | **1** | OL435316-Nigeria |
| Hap132 | **1** | OL435315-Nigeria |
| Hap133 | **1** | OL435314-Nigeria |
| Hap134 | **1** | OL435313-Nigeria |
| Hap135 | **2** | OL435312-Nigeria OL435386-Nigeria |
| Hap136 | **1** | OL435311-Nigeria |
| Hap137 | **1** | OL435310-Nigeria |
| Hap138 | **1** | OL435309-Nigeria |
| Hap139 | **1** | OL435308-Nigeria |
| Hap140 | **2** | OL435307-Nigeria OL435283-Nigeria |
| Hap141 | **6** | OL435306-Nigeria OL435303-Nigeria OL435300-Nigeria OL435380-Nigeria OL435521-Nigeria OL435485-Nigeria |
| Hap142 | **1** | OL435305-Nigeria |
| Hap143 | **1** | OL435304-Nigeria |
| Hap144 | **1** | OL435302-Nigeria |
| Hap145 | **1** | OL435301-Nigeria |
| Hap146 | **1** | OL435299-Nigeria |
| Hap147 | **1** | OL435298-Nigeria |
| Hap148 | **1** | OL435297-Nigeria |
| Hap149 | **1** | OL435296-Nigeria |
| Hap150 | **1** | OL435295-Nigeria |
| Hap151 | **1** | OL435294-Nigeria |
| Hap152 | **1** | OL435292-Nigeria |
| Hap153 | **1** | OL435291-Nigeria |
| Hap154 | **1** | OL435290-Nigeria |
| Hap155 | **1** | OL435289-Nigeria |
| Hap156 | **1** | OL435288-Nigeria |
| Hap157 | **1** | OL435287-Nigeria |
| Hap158 | **1** | OL435286-Nigeria |
| Hap159 | **1** | OL435285-Nigeria |
| Hap160 | **1** | OL435284-Nigeria |
| Hap161 | **1** | OL435282-Nigeria |
| Hap162 | **1** | OL435281-Nigeria |
| Hap163 | **1** | OL435280-Nigeria |
| Hap164 | **1** | OL435279-Nigeria |
| Hap165 | **1** | OL435278-Nigeria |
| Hap166 | **1** | OL435277-Nigeria |
| Hap167 | **1** | OL435276-Nigeria |
| Hap168 | **1** | OL435275-Nigeria |
| Hap169 | **1** | OL435274-Nigeria |
| Hap170 | **1** | OL435272-Nigeria |
| Hap171 | **1** | OL435271-Nigeria |
| Hap172 | **1** | OL435270-Nigeria |
| Hap173 | **1** | OL435269-Nigeria |
| Hap174 | **1** | OL435268-Nigeria |
| Hap175 | **1** | OL435267-Nigeria |
| Hap176 | **2** | OL435368-Nigeria OL435367-Nigeria |
| Hap177 | **1** | OL435366-Nigeria |
| Hap178 | **1** | OL435365-Nigeria |
| Hap179 | **1** | OL435364-Nigeria |
| Hap180 | **1** | OL435455-Nigeria |
| Hap181 | **1** | OL435454-Nigeria |
| Hap182 | **1** | OL435453-Nigeria |
| Hap183 | **2** | OL435451-Nigeria OL435379-Nigeria |
| Hap184 | **1** | OL435450-Nigeria |
| Hap185 | **1** | OL435449-Nigeria |
| Hap186 | **1** | OL435448-Nigeria |
| Hap187 | **1** | OL435447-Nigeria |
| Hap188 | **2** | OL435446-Nigeria OL435369-Nigeria |
| Hap189 | **1** | OL435445-Nigeria |
| Hap190 | **2** | OL435444-Nigeria OL435373-Nigeria |
| Hap191 | **1** | OL435443-Nigeria |
| Hap192 | **1** | OL435442-Nigeria |
| Hap193 | **1** | OL435441-Nigeria |
| Hap194 | **1** | OL435440-Nigeria |
| Hap195 | **2** | OL435439-Nigeria OL435511-Nigeria |
| Hap196 | **1** | OL435438-Nigeria |
| Hap197 | **1** | OL435435-Nigeria |
| Hap198 | **1** | OL435434-Nigeria |
| Hap199 | **1** | OL435433-Nigeria |
| Hap200 | **1** | OL435432-Nigeria |
| Hap201 | **1** | OL435431-Nigeria |
| Hap202 | **1** | OL435430-Nigeria |
| Hap203 | **1** | OL435429-Nigeria |
| Hap204 | **1** | OL435428-Nigeria |
| Hap205 | **1** | OL435427-Nigeria |
| Hap206 | **1** | OL435426-Nigeria |
| Hap207 | **1** | OL435425-Nigeria |
| Hap208 | **1** | OL435423-Nigeria |
| Hap209 | **2** | OL435420-Nigeria OL435505-Nigeria |
| Hap210 | **1** | OL435419-Nigeria |
| Hap211 | **2** | OL435418-Nigeria OL435417-Nigeria |
| Hap212 | **1** | OL435416-Nigeria |
| Hap213 | **1** | OL435415-Nigeria |
| Hap214 | **1** | OL435414-Nigeria |
| Hap215 | **1** | OL435412-Nigeria |
| Hap216 | **1** | OL435411-Nigeria |
| Hap217 | **1** | OL435410-Nigeria |
| Hap218 | **1** | OL435409-Nigeria |
| Hap219 | **1** | OL435408-Nigeria |
| Hap220 | **1** | OL435407-Nigeria |
| Hap221 | **1** | OL435406-Nigeria |
| Hap222 | **1** | OL435405-Nigeria |
| Hap223 | **1** | OL435404-Nigeria |
| Hap224 | **1** | OL435403-Nigeria |
| Hap225 | **1** | OL435401-Nigeria |
| Hap226 | **1** | OL435400-Nigeria |
| Hap227 | **1** | OL435399-Nigeria |
| Hap228 | **1** | OL435398-Nigeria |
| Hap229 | **1** | OL435397-Nigeria |
| Hap230 | **1** | OL435396-Nigeria |
| Hap231 | **1** | OL435395-Nigeria |
| Hap232 | **1** | OL435394-Nigeria |
| Hap233 | **1** | OL435393-Nigeria |
| Hap234 | **1** | OL435392-Nigeria |
| Hap235 | **1** | OL435391-Nigeria |
| Hap236 | **1** | OL435390-Nigeria |
| Hap237 | **1** | OL435388-Nigeria |
| Hap238 | **1** | OL435387-Nigeria |
| Hap239 | **1** | OL435385-Nigeria |
| Hap240 | **1** | OL435384-Nigeria |
| Hap241 | **1** | OL435383-Nigeria |
| Hap242 | **1** | OL435382-Nigeria |
| Hap243 | **2** | OL435378-Nigeria OL435377-Nigeria |
| Hap244 | **1** | OL435376-Nigeria |
| Hap245 | **1** | OL435375-Nigeria |
| Hap246 | **1** | OL435374-Nigeria |
| Hap247 | **1** | OL435372-Nigeria |
| Hap248 | **1** | OL435371-Nigeria |
| Hap249 | **1** | OL435370-Nigeria |
| Hap250 | **1** | OL435458-Nigeria |
| Hap251 | **1** | OL435457-Nigeria |
| Hap252 | **1** | OL435535-Nigeria |
| Hap253 | **1** | OL435534-Nigeria |
| Hap254 | **1** | OL435533-Nigeria |
| Hap255 | **1** | OL435532-Nigeria |
| Hap256 | **1** | OL435531-Nigeria |
| Hap257 | **2** | OL435528-Nigeria OL435502-Nigeria |
| Hap258 | **1** | OL435527-Nigeria |
| Hap259 | **1** | OL435525-Nigeria |
| Hap260 | **1** | OL435524-Nigeria |
| Hap261 | **1** | OL435523-Nigeria |
| Hap262 | **1** | OL435522-Nigeria |
| Hap263 | **1** | OL435520-Nigeria |
| Hap264 | **1** | OL435519-Nigeria |
| Hap265 | **1** | OL435518-Nigeria |
| Hap266 | **1** | OL435517-Nigeria |
| Hap267 | **1** | OL435516-Nigeria |
| Hap268 | **1** | OL435515-Nigeria |
| Hap269 | **1** | OL435514-Nigeria |
| Hap270 | **1** | OL435513-Nigeria |
| Hap271 | **1** | OL435512-Nigeria |
| Hap272 | **2** | OL435510-Nigeria OL435503-Nigeria |
| Hap273 | **1** | OL435508-Nigeria |
| Hap274 | **1** | OL435507-Nigeria |
| Hap275 | **1** | OL435506-Nigeria |
| Hap276 | **1** | OL435504-Nigeria |
| Hap277 | **1** | OL435501-Nigeria |
| Hap278 | **1** | OL435500-Nigeria |
| Hap279 | **1** | OL435499-Nigeria |
| Hap280 | **1** | OL435498-Nigeria |
| Hap281 | **1** | OL435497-Nigeria |
| Hap282 | **1** | OL435496-Nigeria |
| Hap283 | **1** | OL435495-Nigeria |
| Hap284 | **1** | OL435494-Nigeria |
| Hap285 | **1** | OL435493-Nigeria |
| Hap286 | **1** | OL435492-Nigeria |
| Hap287 | **1** | OL435491-Nigeria |
| Hap288 | **1** | OL435490-Nigeria |
| Hap289 | **1** | OL435489-Nigeria |
| Hap290 | **2** | OL435488-Nigeria OL435460-Nigeria |
| Hap291 | **1** | OL435487-Nigeria |
| Hap292 | **1** | OL435486-Nigeria |
| Hap293 | **1** | OL435484-Nigeria |
| Hap294 | **1** | OL435483-Nigeria |
| Hap295 | **1** | OL435482-Nigeria |
| Hap296 | **1** | OL435481-Nigeria |
| Hap297 | **1** | OL435480-Nigeria |
| Hap298 | **1** | OL435479-Nigeria |
| Hap299 | **1** | OL435478-Nigeria |
| Hap300 | **1** | OL435477-Nigeria |
| Hap301 | **1** | OL435476-Nigeria |
| Hap302 | **1** | OL435475-Nigeria |
| Hap303 | **1** | OL435474-Nigeria |
| Hap304 | **1** | OL435473-Nigeria |
| Hap305 | **1** | OL435472-Nigeria |
| Hap306 | **1** | OL435471-Nigeria |
| Hap307 | **1** | OL435470-Nigeria |
| Hap308 | **1** | OL435469-Nigeria |
| Hap309 | **1** | OL435468-Nigeria |
| Hap310 | **1** | OL435467-Nigeria |
| Hap311 | **1** | OL435466-Nigeria |
| Hap312 | **1** | OL435465-Nigeria |
| Hap313 | **1** | OL435464-Nigeria |
| Hap314 | **1** | OL435463-Nigeria |
| Hap315 | **1** | OL435462-Nigeria |
| Hap316 | **1** | OL435461-Nigeria |
| Hap317 | **1** | OL435459-Nigeria |
| Hap318 | **2** | EU346694-Australia NC010383-Australia |
| Hap319 | **1** | CP035799-New Zealand |
| Hap320 | **1** | OL435529-Nigeria |
| Hap321 | **1** | OL435273-Nigeria |
| Hap322 | **1** | OL435362-Nigeria |
| Hap323 | **2** | OP785768-Mexico OP785769-Mexico |
| Hap324 | **1** | ON005159-India |