Gamma algorithms report

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Executive Summary:

This report analyzes different algorithms focused on differentiating among Chrysina kalinini, C. resplendens and C. cupreomarginata species. These algorithms will analyze a particular spectrum and will produce a number. That index is going to be averaged and a boxplot will be made for each species. This information can be used in the future to analyze unknown spectra and make a guess of the most probable identity for a sample.

Specimen Information:

The following collections were used: INBIO
Number of specimens per species:

cupreomarginata	resplendens	kalinini
22	20	21

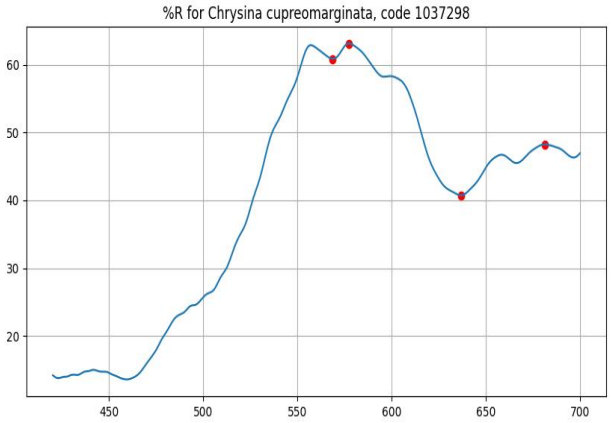
Relevant data:

code	genus	species	measuring_mode
1037298	Chrysina	cupreomarginata	%R
1037299	Chrysina	cupreomarginata	%R
1037308	Chrysina	resplendens	%R
1037312	Chrysina	resplendens	%R
1054219	Chrysina	cupreomarginata	%R
1309367	Chrysina	resplendens	%R
1717606	Chrysina	kalinini	%R
1736458	Chrysina	kalinini	%R
1736459	Chrysina	kalinini	%R
209836	Chrysina	kalinini	%R
2181994	Chrysina	resplendens	%R
2195354	Chrysina	kalinini	%R
2195355	Chrysina	kalinini	%R
2195357	Chrysina	kalinini	%R
2195358	Chrysina	kalinini	%R
2234738	Chrysina	kalinini	%R

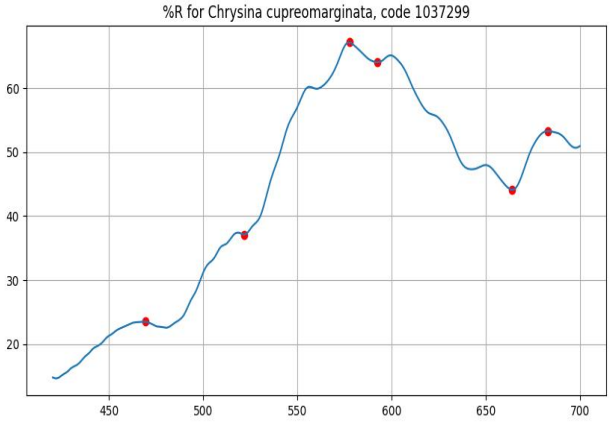
2248544	Chrysina	cupreomarginata	%R
2249504	Chrysina	cupreomarginata	%R
2249505	Chrysina	cupreomarginata	%R
2253302	Chrysina	cupreomarginata	%R
2361339	Chrysina	cupreomarginata	%R
2375565	Chrysina	cupreomarginata	%R
2376856	Chrysina	cupreomarginata	%R
2376857	Chrysina	cupreomarginata	%R
2388550	Chrysina	cupreomarginata	%R
2388554	Chrysina	cupreomarginata	%R
2422833	Chrysina	cupreomarginata	%R
2422834	Chrysina	cupreomarginata	%R
2452030	Chrysina	cupreomarginata	%R
2453057	Chrysina	cupreomarginata	%R
2456006	Chrysina	kalinini	%R
2467329	Chrysina	cupreomarginata	%R
2548659	Chrysina	kalinini	%R
3036568	Chrysina	kalinini	%R
3045302	Chrysina	kalinini	%R
3102408	Chrysina	kalinini	%R
3102412	Chrysina	kalinini	%R
3169943	Chrysina	kalinini	%R
3353565	Chrysina	resplendens	%R
3359158	Chrysina	resplendens	%R
353553	Chrysina	kalinini	%R
3708178	Chrysina	resplendens	%R
3710592	Chrysina	resplendens	%R
3720411	Chrysina	resplendens	%R
3731054	Chrysina	resplendens	%R
4090505	Chrysina	resplendens	%R
4090508	Chrysina	resplendens	%R
4146715	Chrysina	cupreomarginata	%R
419121	Chrysina	resplendens	%R
4224244	Chrysina	resplendens	%R
4224249	Chrysina	resplendens	%R

4249297	Chrysina	resplendens	%R
4294666	Chrysina	resplendens	%R
4298666	Chrysina	cupreomarginata	%R
532145	Chrysina	cupreomarginata	%R
532146	Chrysina	cupreomarginata	%R
623604	Chrysina	resplendens	%R
668621	Chrysina	resplendens	%R
714869	Chrysina	kalinini	%R
714947	Chrysina	kalinini	%R
776563	Chrysina	kalinini	%R
856696	Chrysina	resplendens	%R
987517	Chrysina	kalinini	%R

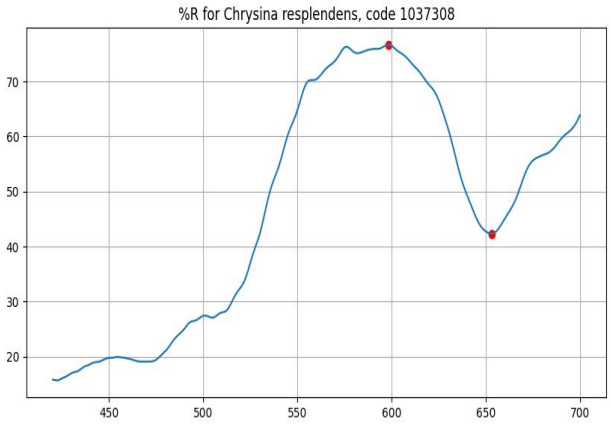
Spectral information :



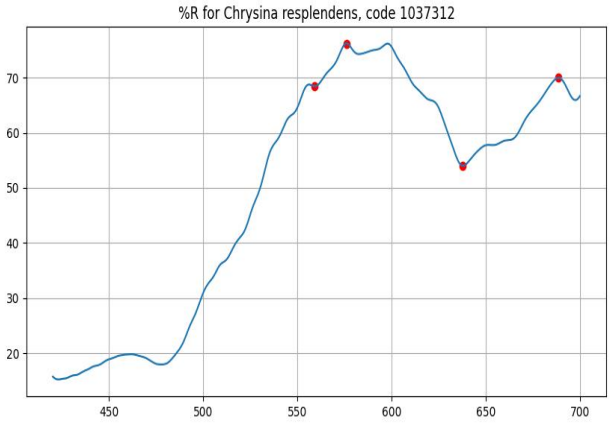
Peaks: ([568.589576, 577.154202, 636.876171, 681.381367], [60.859589, 63.136977, 40.723439, 48.252804])



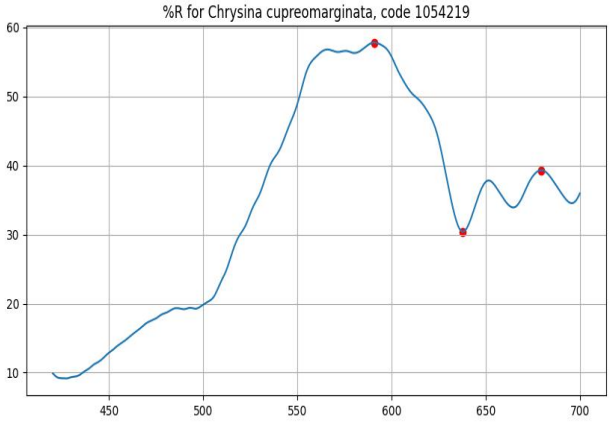
Peaks: ([469.143818, 521.779757, 577.582226, 592.550458, 664.03405, 683.071605], [23.509616, 37.123552, 67.153444, 64.053397, 44.108248, 53.276773])



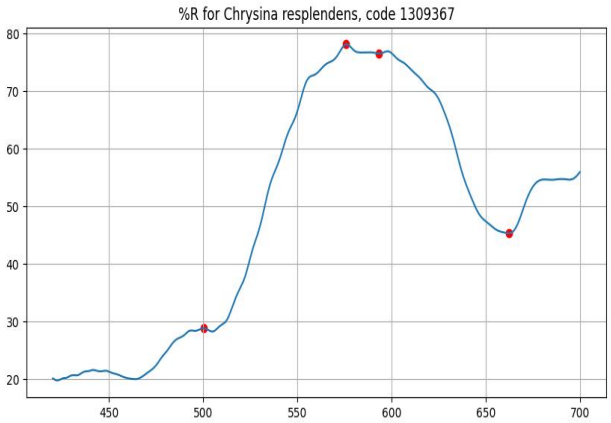
Peaks: ([598.530766, 653.012587], [76.759573, 42.356059])



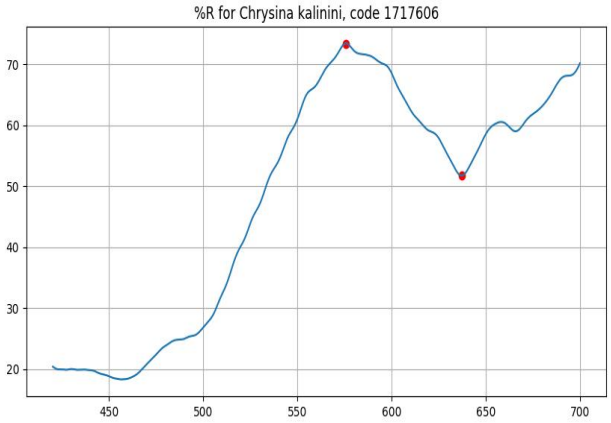
Peaks: ([559.159518, 576.298093, 637.726275, 688.562162], [68.431068, 76.216069, 53.991858, 69.947796])



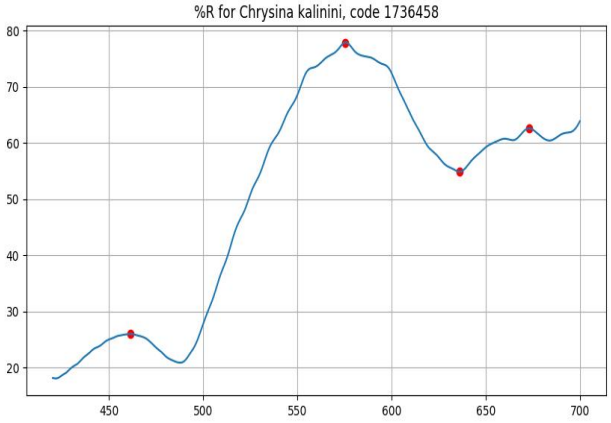
Peaks: ([590.841058, 637.726275, 679.268017], [57.79059, 30.410927, 39.293516])



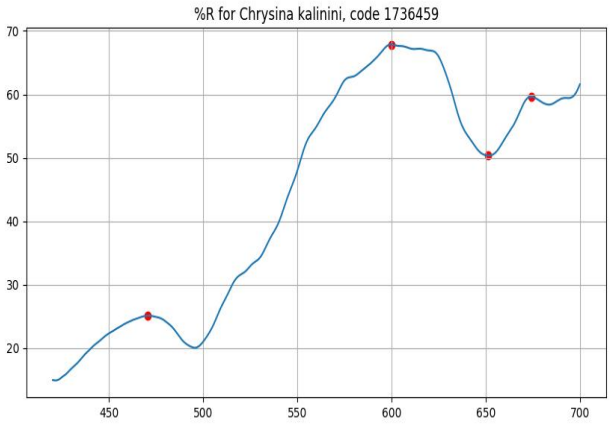
Peaks: ([500.236911, 575.870009, 593.405034, 662.339475], [28.819805, 78.096577, 76.525365, 45.314398])



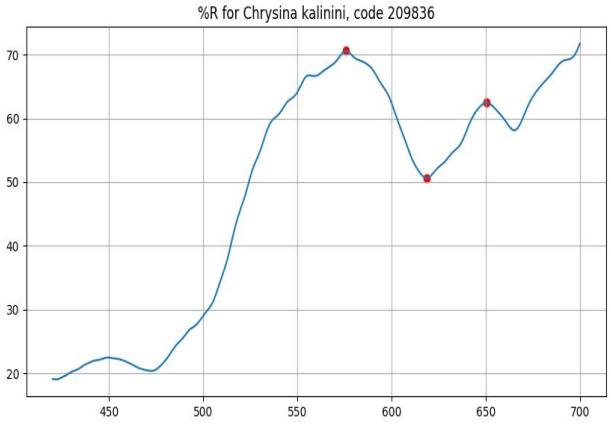
Peaks: ([575.870009, 637.301234], [73.44052, 51.736379])



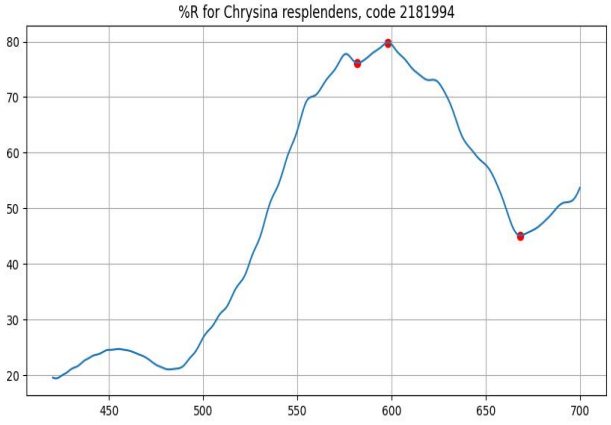
Peaks: ([461.358099, 575.441906, 636.025978, 672.924321], [26.015476, 77.939481, 54.917997, 62.605239])



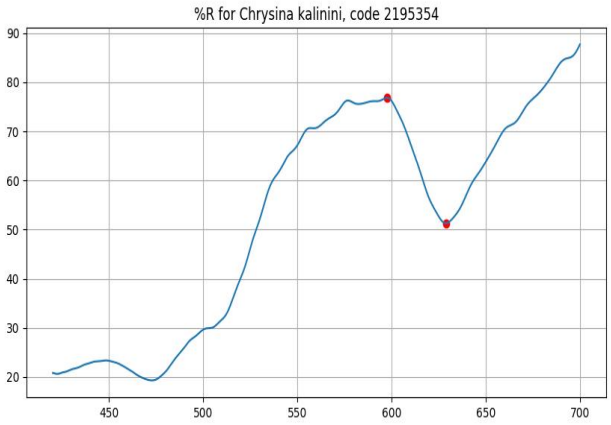
Peaks: ([470.440968, 599.811733, 651.315577, 674.193496], [25.100191, 67.874586, 50.329334, 59.634923])



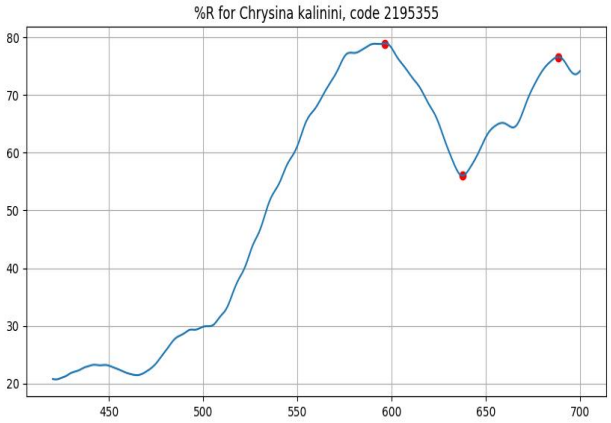
Peaks: ([575.870009, 618.57745, 650.466933], [70.570226, 50.618616, 62.439184])



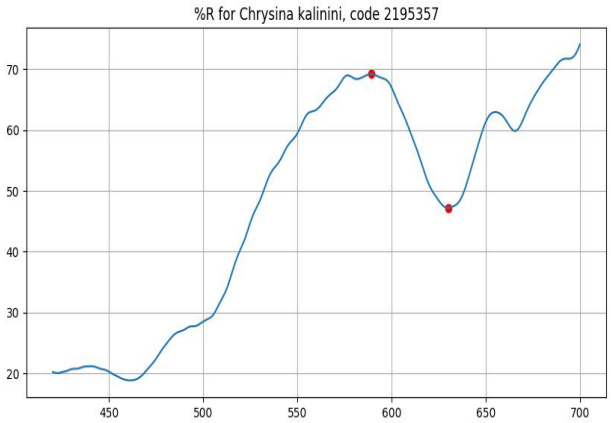
Peaks: ([581.861378, 598.103735, 668.268827], [76.151983, 79.830542, 45.121157])



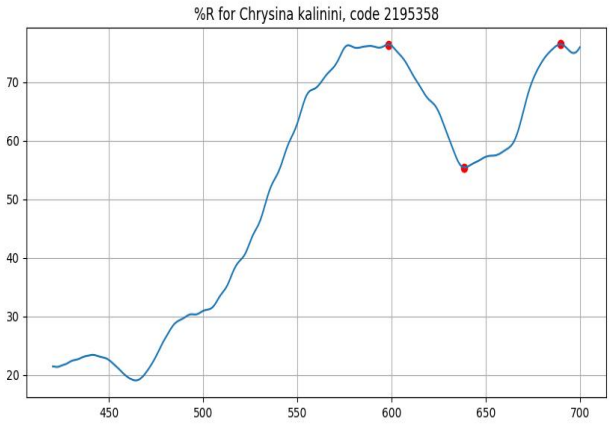
Peaks: ([597.676684, 628.795725], [76.832665, 51.293623])



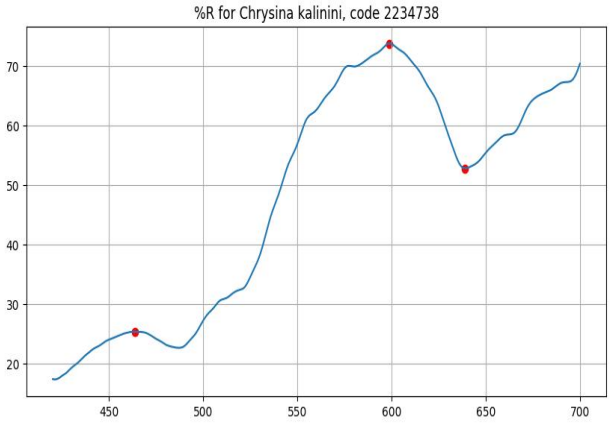
Peaks: ([596.395406, 637.726275, 688.562162], [78.94684, 56.038144, 76.590602])



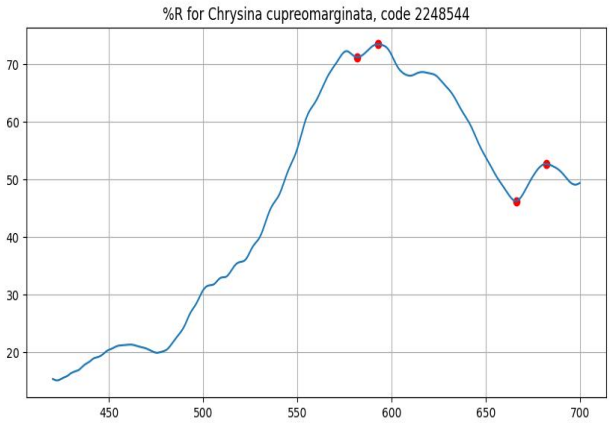
Peaks: ([589.131332, 630.072119], [69.192098, 47.197807])



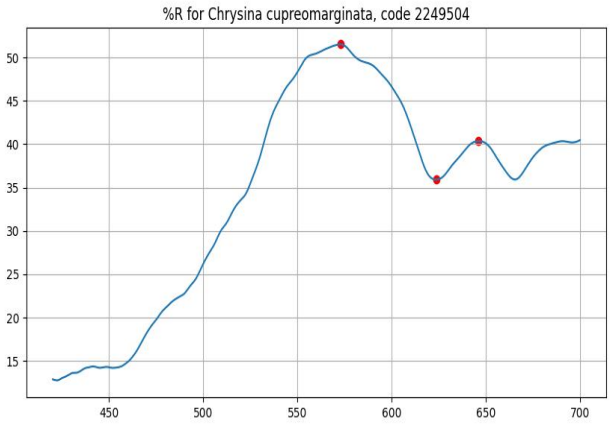
Peaks: ([598.530766, 638.576288, 689.828619], [76.416134, 55.4002, 76.437391])



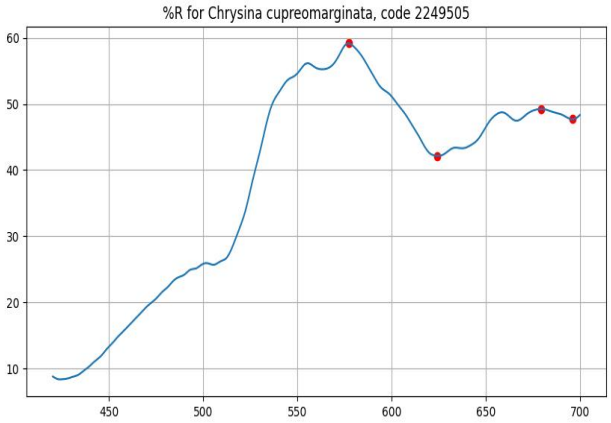
Peaks: ([463.953873, 598.957775, 639.001261], [25.378486, 73.818416, 52.814506])



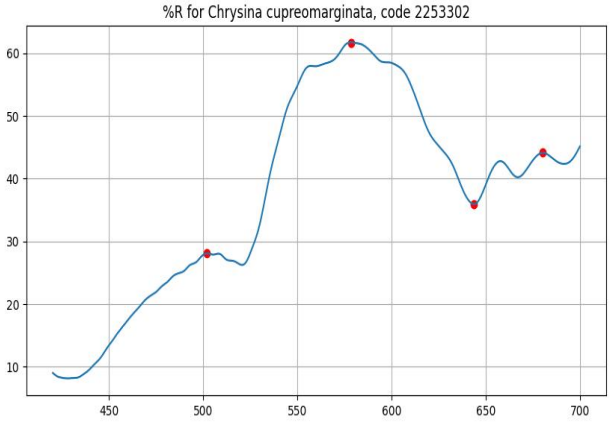
Peaks: ([581.861378, 592.977756, 666.151736, 682.226535], [71.279759, 73.47079, 46.302617, 52.721244])



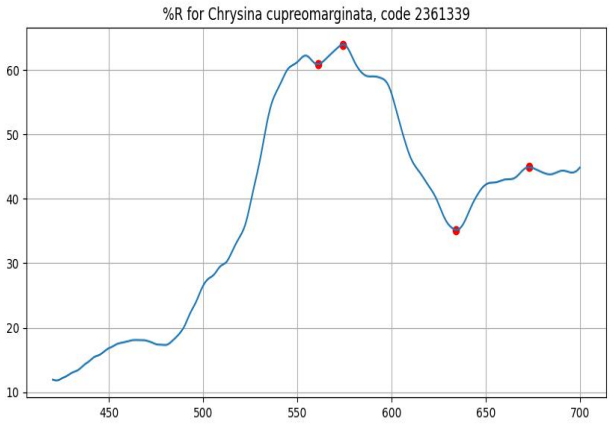
Peaks: ([572.87287, 623.688163, 646.22233], [51.505324, 35.913324, 40.355805])



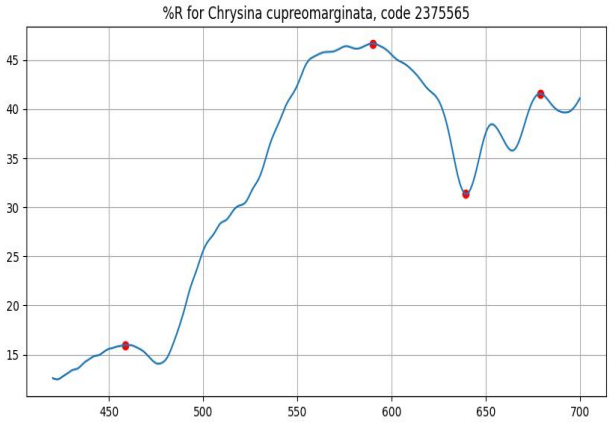
Peaks: ([577.154202, 624.113914, 679.268017, 696.15754], [59.150571, 42.158063, 49.246974, 47.689136])



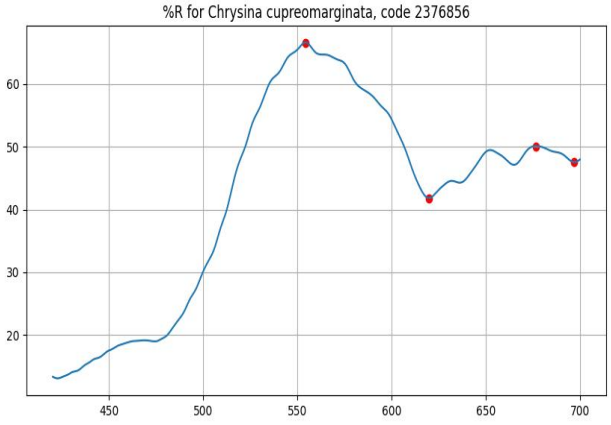
Peaks: ([501.961878, 578.438216, 643.674469, 680.11343], [28.069854, 61.716063, 35.940737, 44.123592])



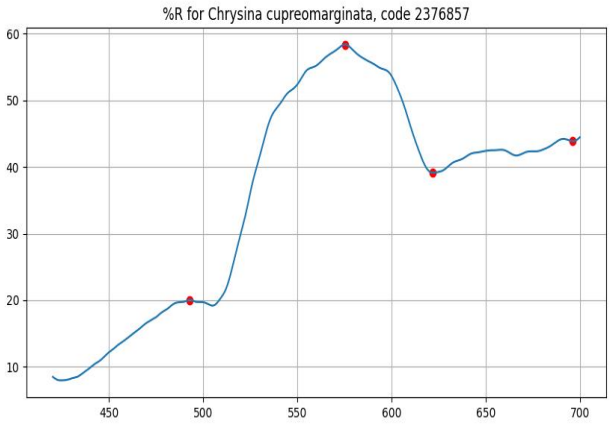
Peaks: ([560.874765, 574.157476, 634.325322, 672.924321], [60.877177, 63.952555, 35.192828, 44.895584])



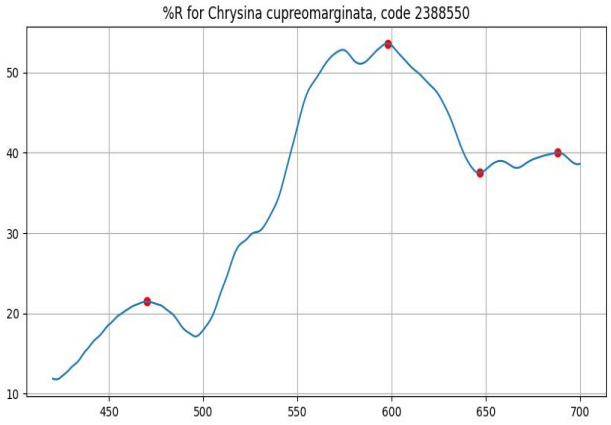
Peaks: ([458.761797, 589.986236, 639.426211, 678.845274], [15.972198, 46.699006, 31.35932, 41.569637])



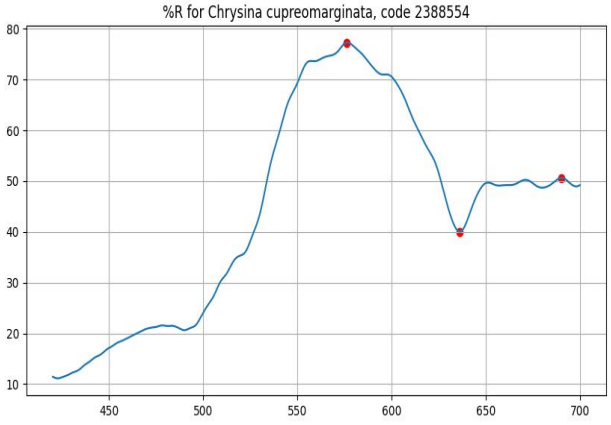
Peaks: ([554.441027, 619.855422, 676.731194, 697.00097], [66.593132, 41.804607, 50.089253, 47.530608])



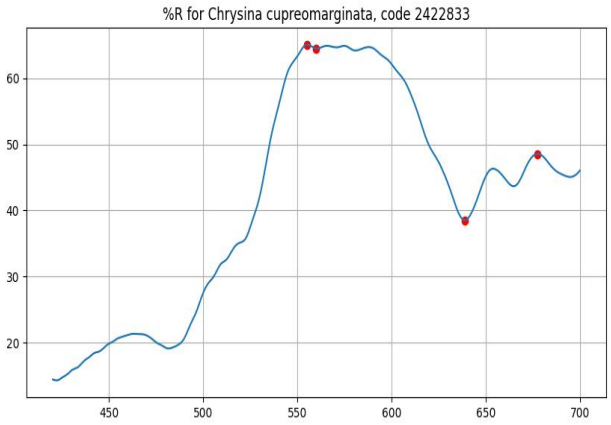
Peaks: ([492.902886, 575.441906, 621.984941, 696.15754], [20.052154, 58.359404, 39.129607, 43.856728])



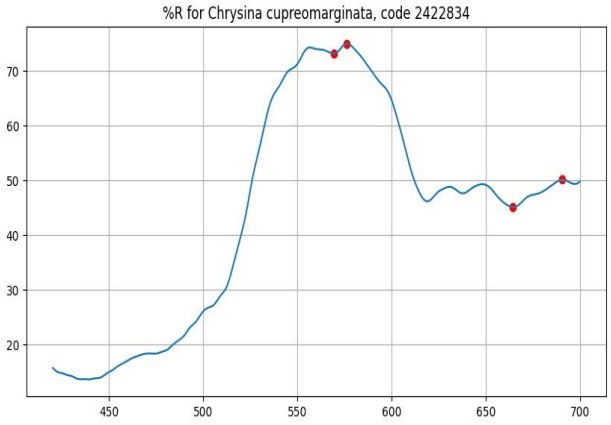
Peaks: ([470.0086, 598.103735, 646.646894, 688.139959], [21.447882, 53.633156, 37.502188, 40.007248])



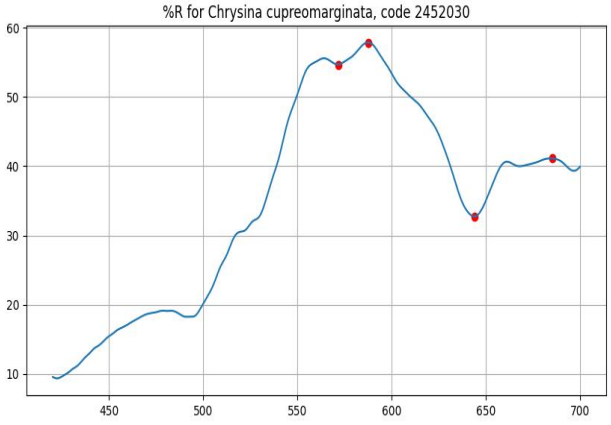
Peaks: ([576.298093, 636.025978, 690.250722], [77.340061, 40.054744, 50.640874])



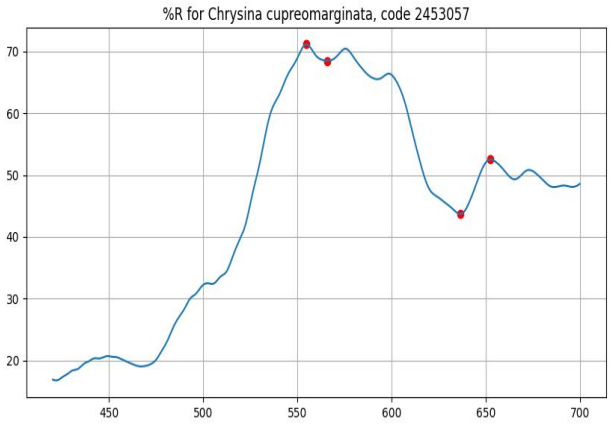
Peaks: ([555.299104, 560.01718, 639.001261, 677.576899], [65.087949, 64.4671, 38.526174, 48.534183])



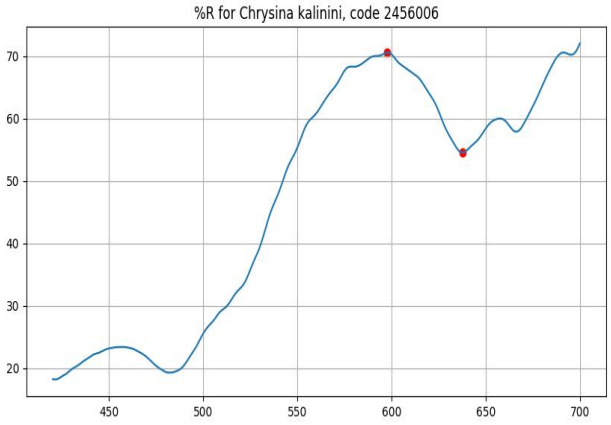
Peaks: ([569.446391, 576.298093, 664.457635, 690.6728], [73.206089, 75.044061, 45.127051, 50.147295])



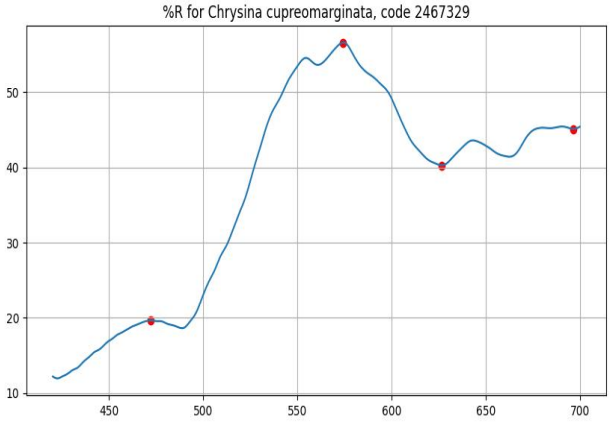
Peaks: ([571.588087, 587.848823, 644.099169, 685.183851], [54.678635, 57.867774, 32.760867, 41.122179])



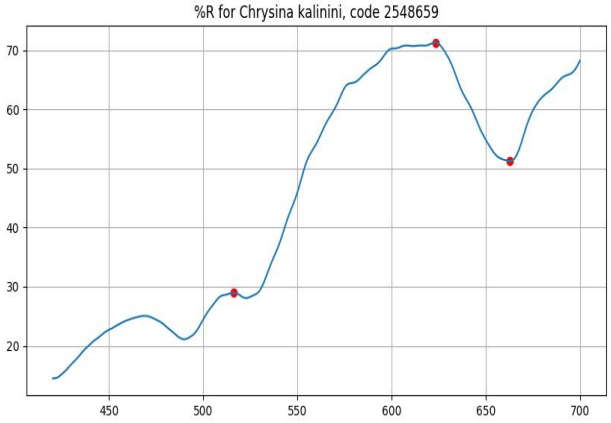
Peaks: ([554.870075, 566.018666, 636.451086, 652.58837], [71.145778, 68.493189, 43.708523, 52.516359])



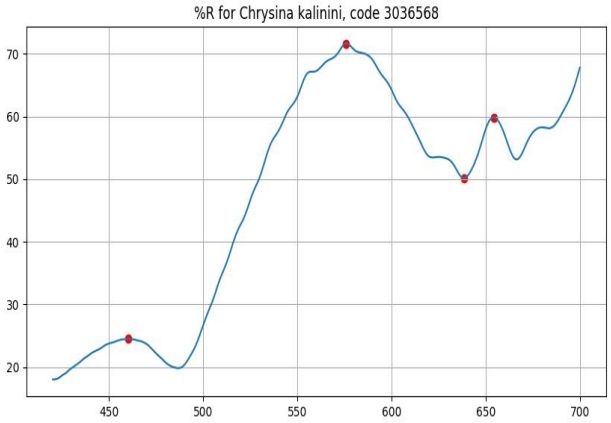
Peaks: ([597.676684, 637.726275], [70.594387, 54.572467])



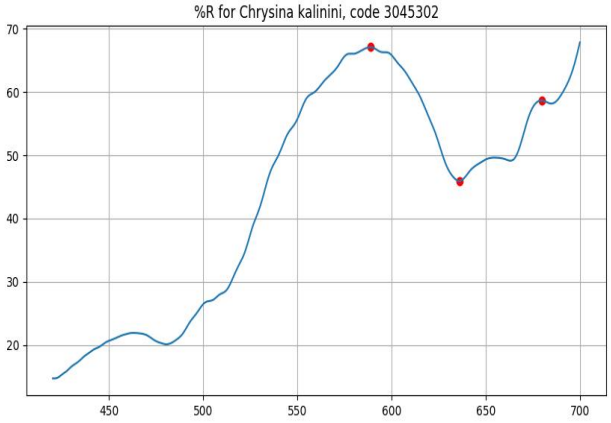
Peaks: ([472.170289, 574.157476, 626.66796, 696.579268], [19.621125, 56.632717, 40.274267, 45.120305])



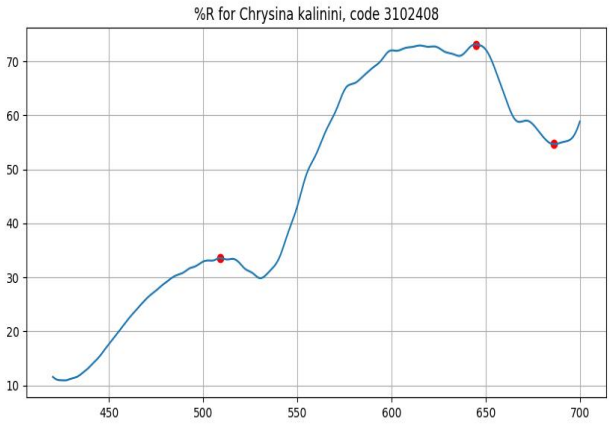
Peaks: ([516.182693, 623.262391, 662.763154], [28.986651, 71.319809, 51.258995])



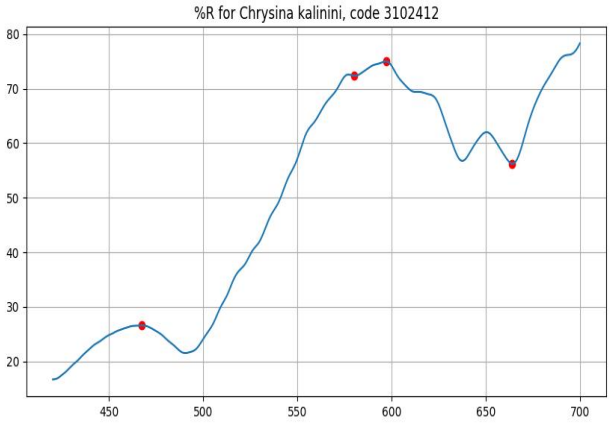
Peaks: ([460.060014, 575.870009, 638.576288, 654.285102], [24.496566, 71.649519, 50.167453, 59.85023])



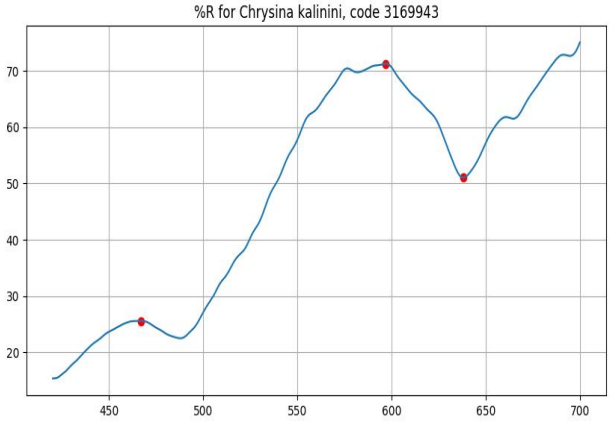
Peaks: ([588.703849, 636.025978, 679.690736], [67.121025, 45.928967, 58.665919])



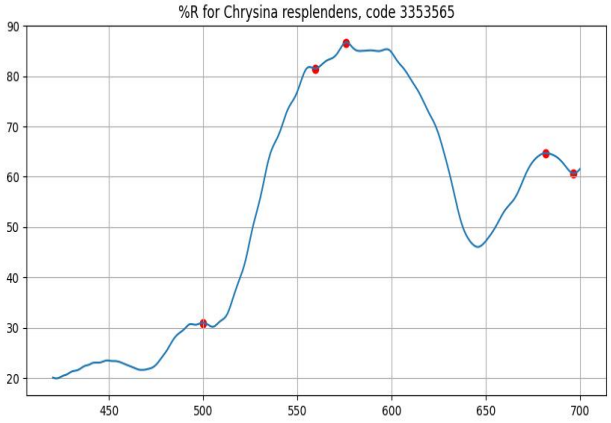
Peaks: ([508.859102, 644.948502, 686.028577], [33.592367, 73.136616, 54.671604])



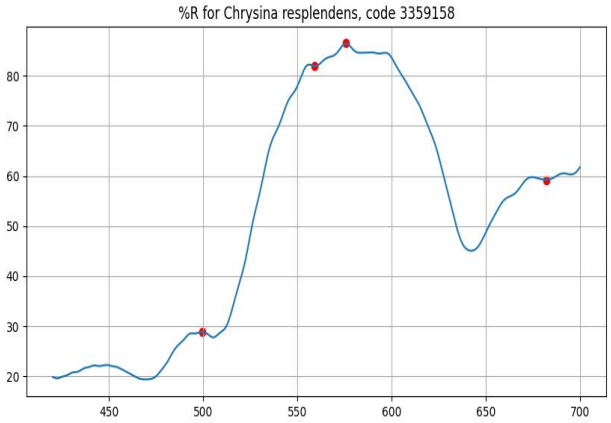
Peaks: ([467.414075, 580.149957, 597.249612, 664.03405], [26.589636, 72.352075, 74.996043, 56.245583])



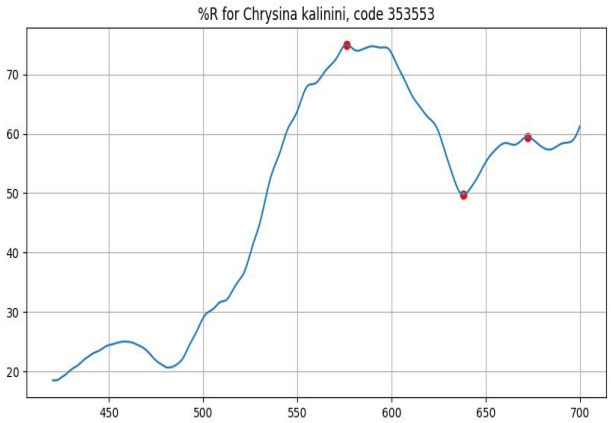
Peaks: ([466.981602, 596.822519, 638.151293], [25.588361, 71.268166, 51.032209])



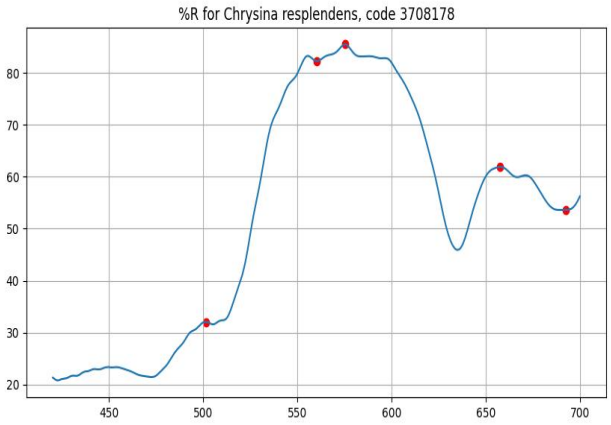
Peaks: ([499.805628, 559.588358, 575.870009, 681.803963, 696.579268], [30.990017, 81.523846, 86.69147, 64.699668, 60.696155])



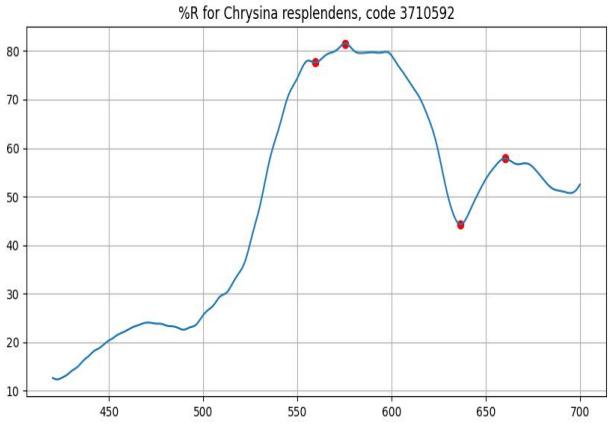
Peaks: ([499.374328, 559.159518, 575.870009, 682.226535], [28.903877, 81.929415, 86.462269, 59.245925])



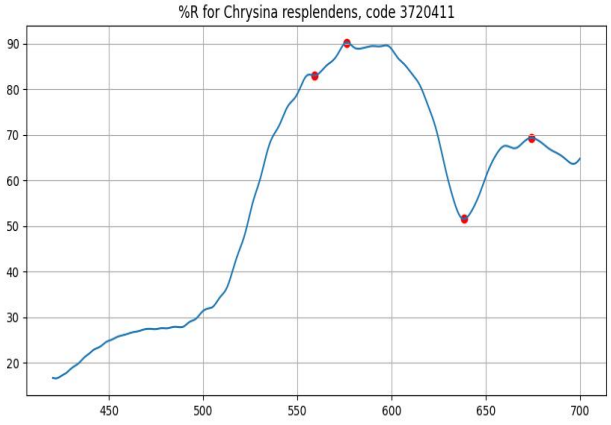
Peaks: ([576.298093, 638.151293, 672.078084], [75.037644, 49.750636, 59.463392])



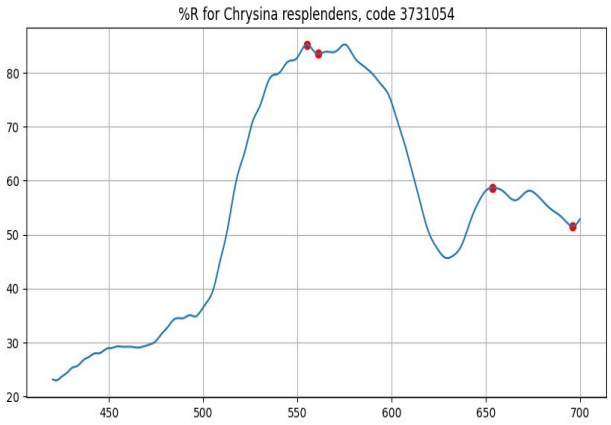
Peaks: ([501.530661, 560.445982, 575.441906, 657.677448, 692.360863], [32.055662, 82.26313, 85.476249, 61.891955, 53.606172])



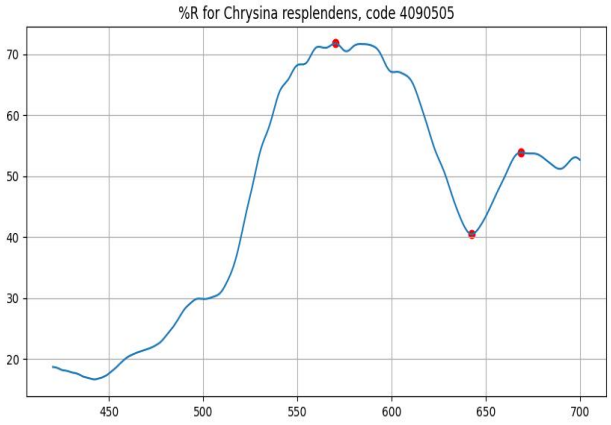
Peaks: ([559.588358, 575.441906, 636.451086, 660.220725], [77.615791, 81.556728, 44.284481, 57.851096])



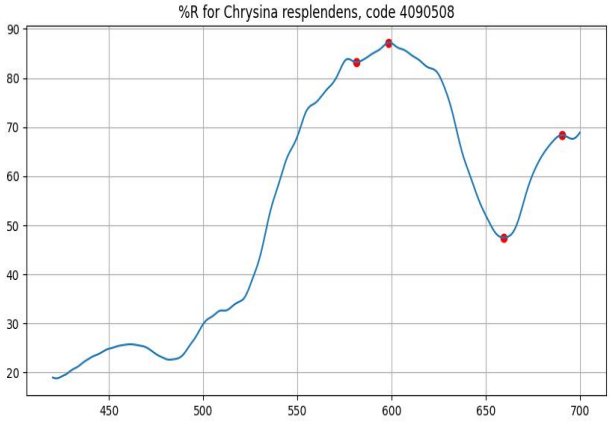
Peaks: ([559.159518, 576.298093, 638.576288, 674.193496], [83.035499, 90.283897, 51.567657, 69.32268])



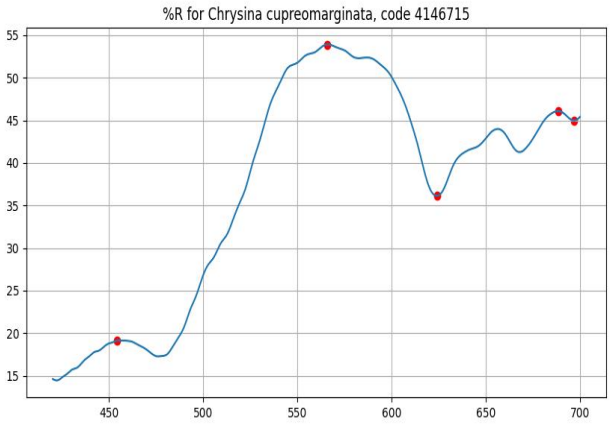
Peaks: ([555.299104, 560.874765, 653.436782, 696.15754], [85.255371, 83.513357, 58.729809, 51.607484])



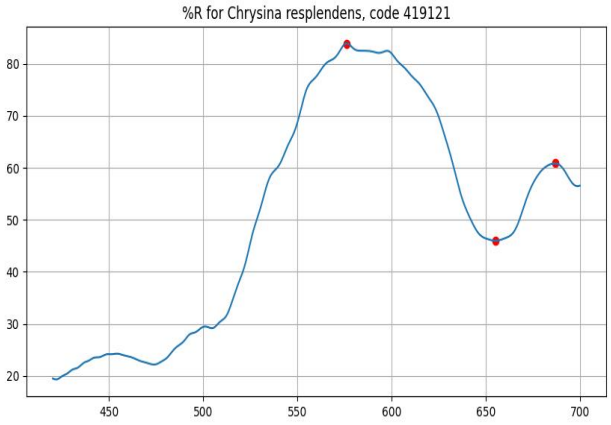
Peaks: ([570.303128, 642.40023, 668.692174], [71.791448, 40.482445, 53.867603])



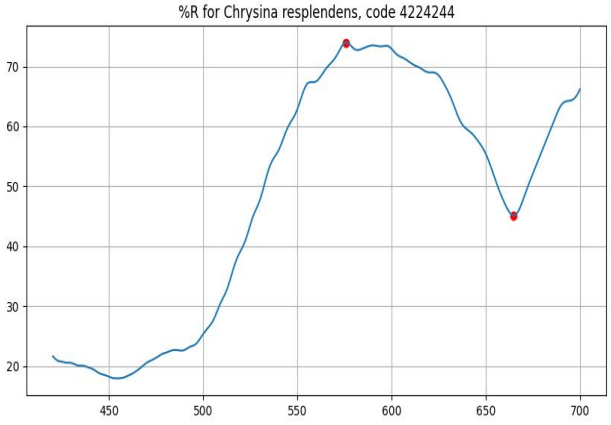
Peaks: ([581.433553, 598.530766, 659.37306, 690.6728], [83.241289, 87.261878, 47.524282, 68.374226])



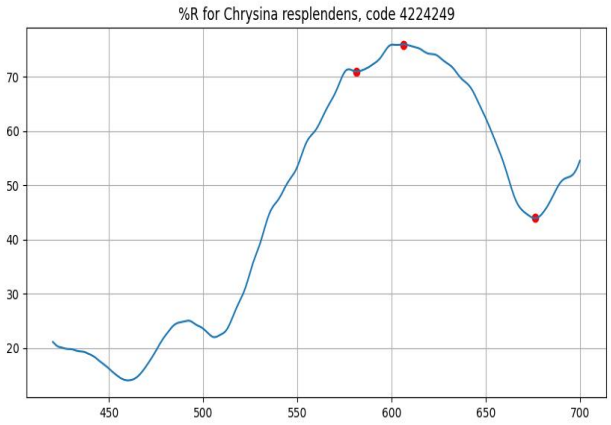
Peaks: ([454.433464, 566.018666, 624.113914, 688.562162, 697.00097], [19.156305, 53.924109, 36.138641, 46.088319, 44.995905])



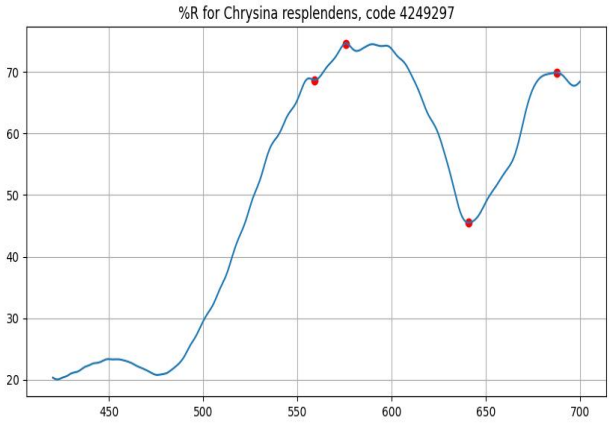
Peaks: ([576.298093, 655.133328, 686.873204], [83.898692, 45.949541, 60.837848])



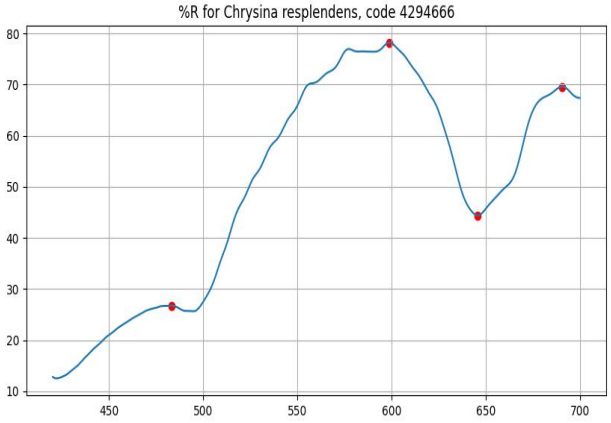
Peaks: ([575.870009, 664.881196], [74.014369, 45.1349])



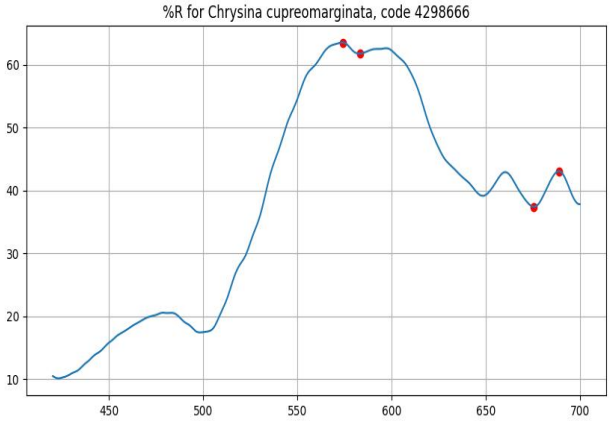
Peaks: ([581.433553, 606.213746, 676.308305], [70.938442, 75.926682, 43.93021])



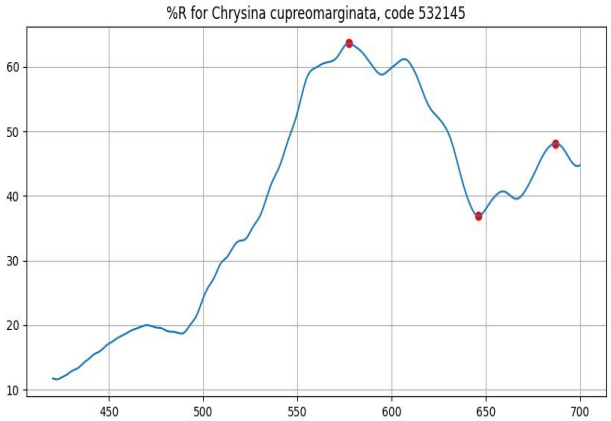
Peaks: ([559.159518, 575.870009, 640.700927, 687.717733], [68.681422, 74.609897, 45.524085, 69.869778])



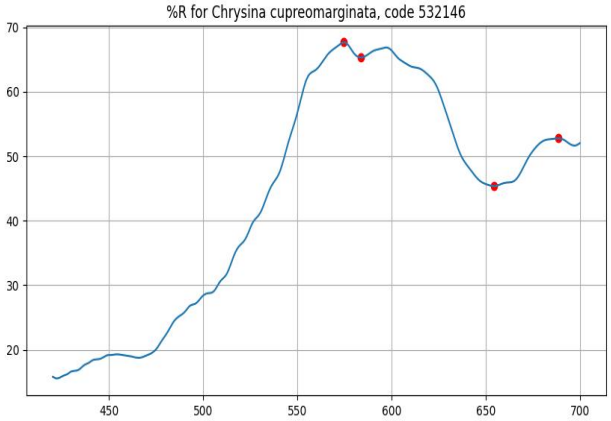
Peaks: ([483.404915, 598.957775, 645.797744, 690.6728], [26.738402, 78.220668, 44.403531, 69.584232])



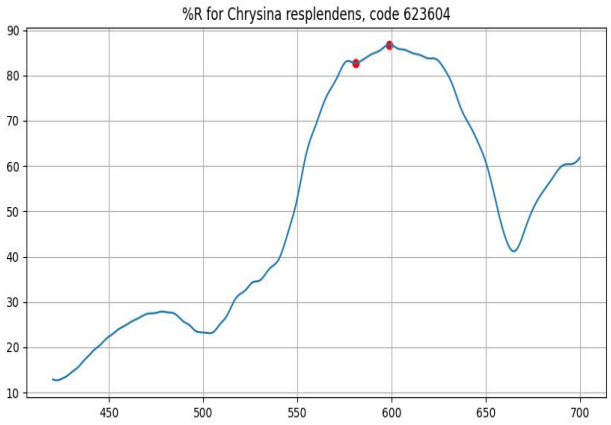
Peaks: ([574.157476, 583.144734, 675.462454, 688.984339], [63.508907, 61.723041, 37.406603, 43.044414])



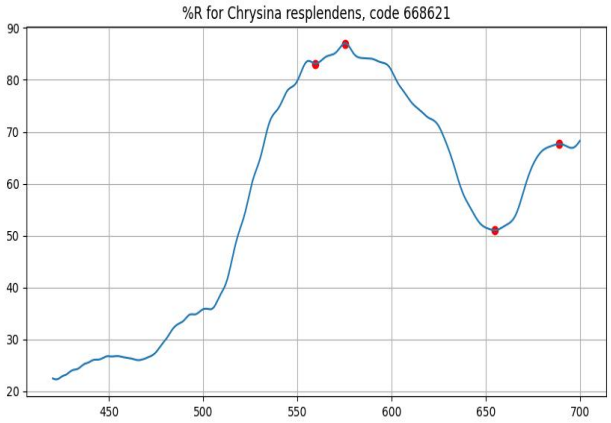
Peaks: ([577.154202, 646.22233, 686.873204], [63.636226, 36.913655, 48.135152])



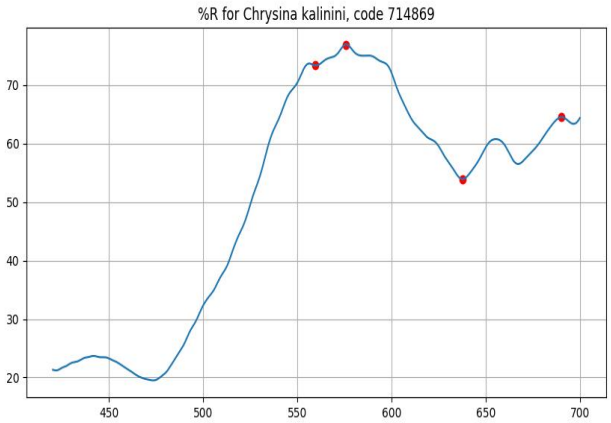
Peaks: ([574.585639, 583.572479, 654.285102, 688.562162], [67.633476, 65.300826, 45.367567, 52.759388])



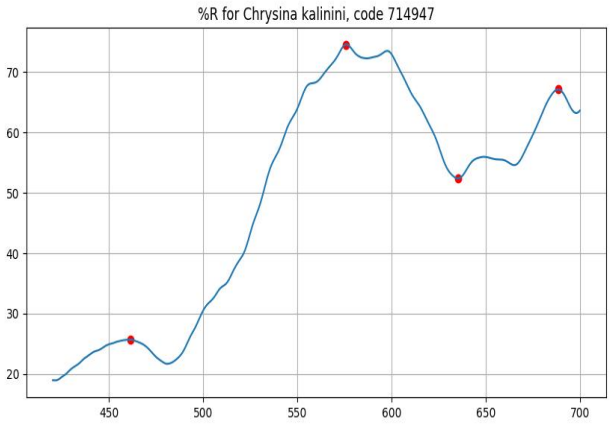
Peaks: ([581.005707, 598.957775], [82.681649, 86.82535])



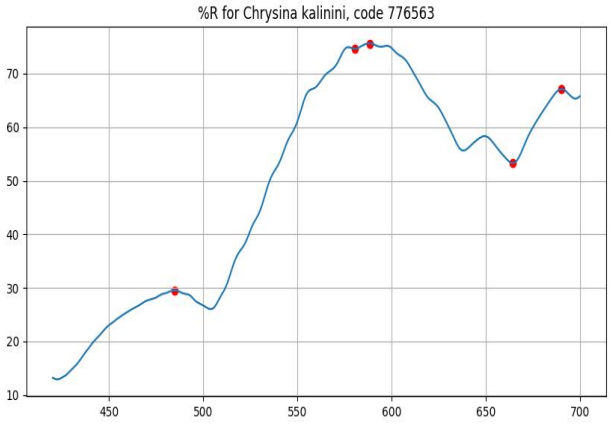
Peaks: ([559.588358, 575.441906, 654.709226, 688.984339], [83.138642, 87.02387, 51.024521, 67.642867])



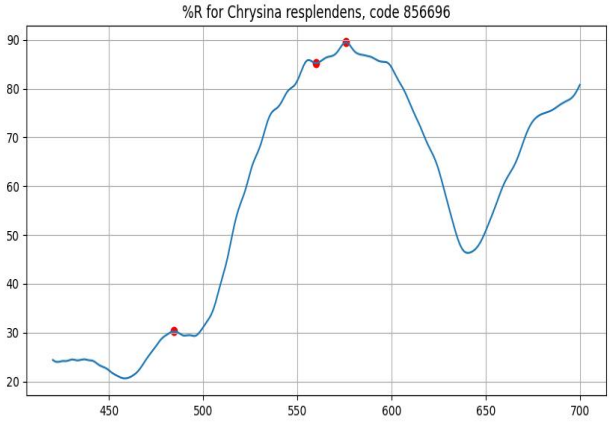
Peaks: ([559.588358, 575.870009, 637.726275, 690.250722], [73.339977, 76.929857, 53.901216, 64.508815])



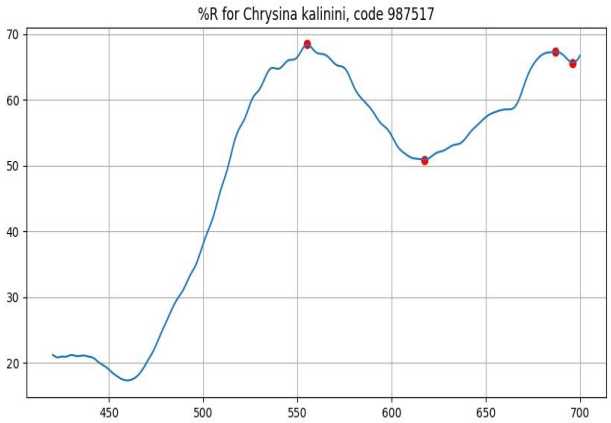
Peaks: ([461.358099, 575.870009, 635.175695, 688.562162], [25.68018, 74.581918, 52.37893, 67.111996])



Peaks: ([484.700544, 580.577842, 588.276346, 664.457635, 690.250722], [29.544743, 74.636147, 75.634687, 53.292674, 67.110798])



Peaks: ([484.268683, 560.01718, 575.870009], [30.289284, 85.210712, 89.443737])



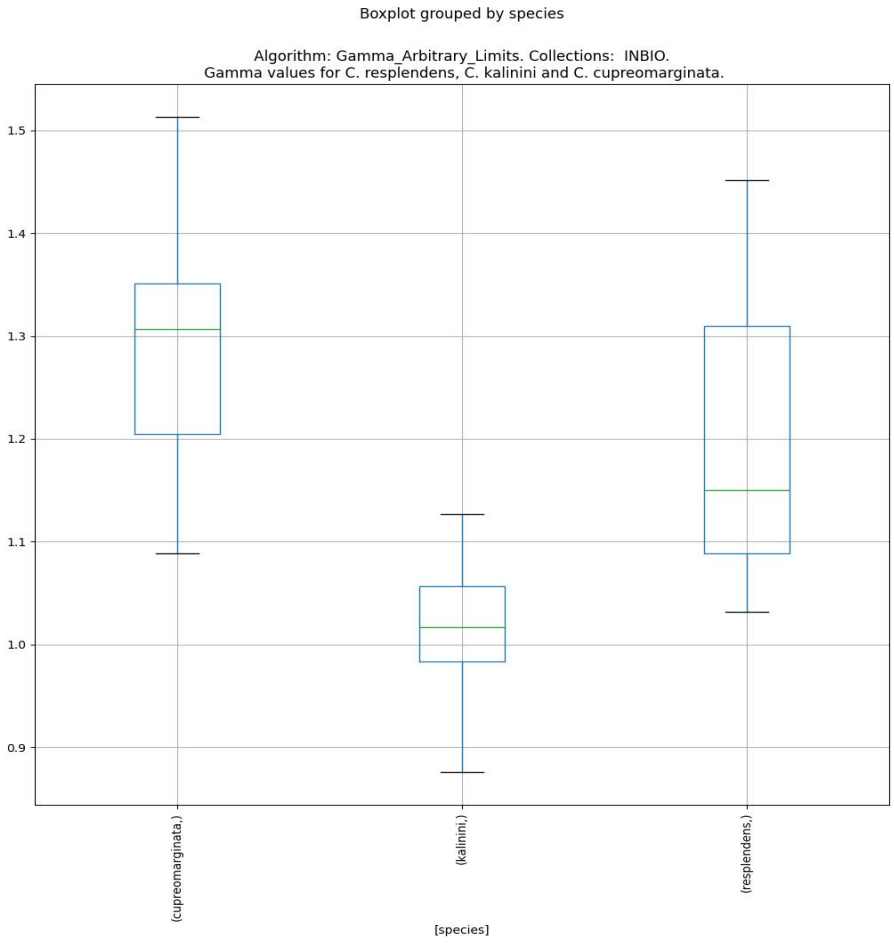
Peaks: ([555.299104, 617.299283, 686.873204, 696.15754], [68.45776, 50.93461, 67.315838, 65.681562])

Algorithm description: Gamma_Arbitrary_Limits

This algorithm calculates the ratio between the highest reflectance peak in the visible range (Between 400 nm and 625 nm) and the maximum peak in the IR range up to 1500 nm. Beyond 1500 nm the internal structure's reflectance generates unwanted noise.

Results

Gamma boxplot for Gamma_Arbitrary_Limits



Differentiable species:

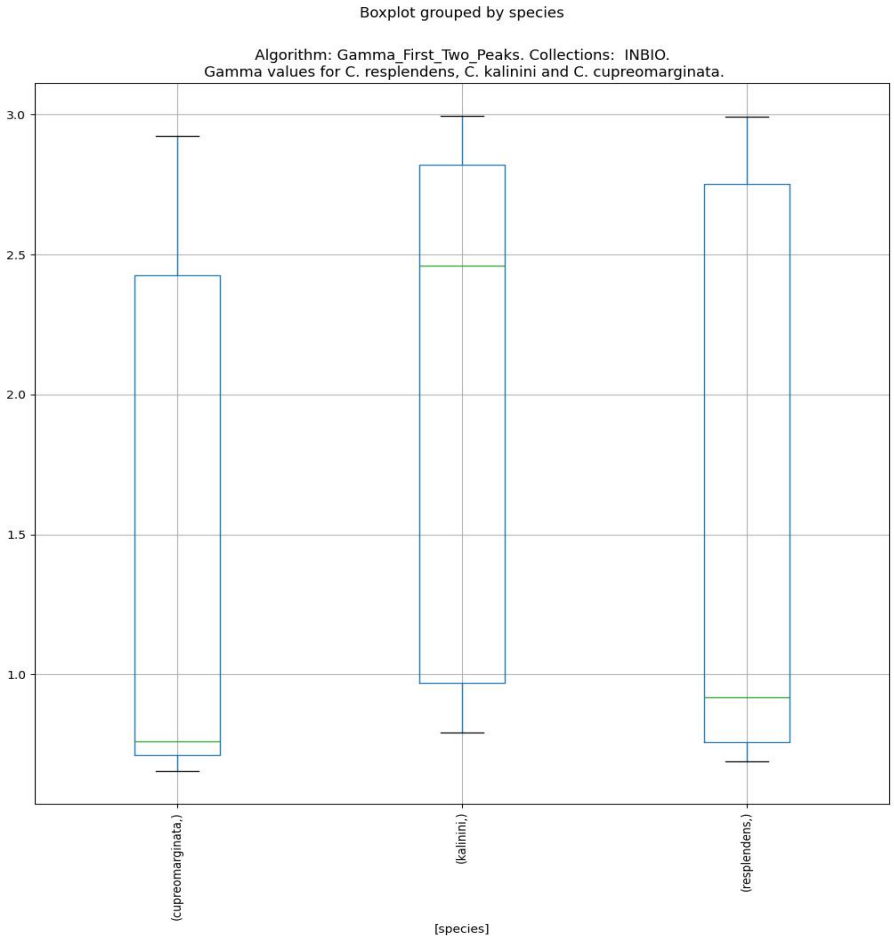
Assuming each species is distributed normally: Differentiable species are: ['kalinini']. 75.0% of these specimens will be found in a region in which the probability of being a specimen of other species is less than 25.0 %.

Algorithm description: Gamma_First_Two_Peaks

This algorithm calculates the ratio between the second and first reflectance peak.

Results

Gamma boxplot for Gamma_First_Two_Peaks



No differentiable species could be found:

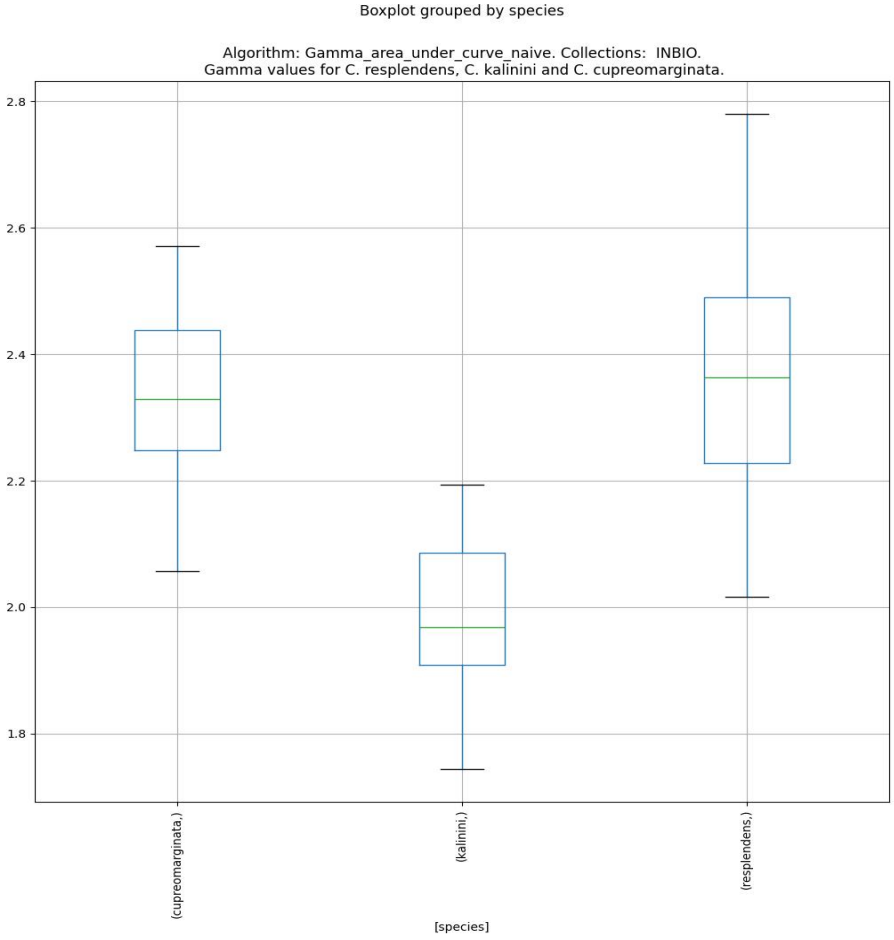
Assuming each species is distributed normally: There is no region in which 75.0% of the specimens of any species would not overlap with other's species central 75.0 percentile of individuals.

Algorithm description: Gamma_area_under_curve_naive

This method calculates the ratio between the area under the curve for the spectrum between 400 and 625 nm (visible range) and between 625 nm and 1500 nm (Infrarred range).

Results

Gamma boxplot for Gamma_area_under_curve_naive



Differentiable species:

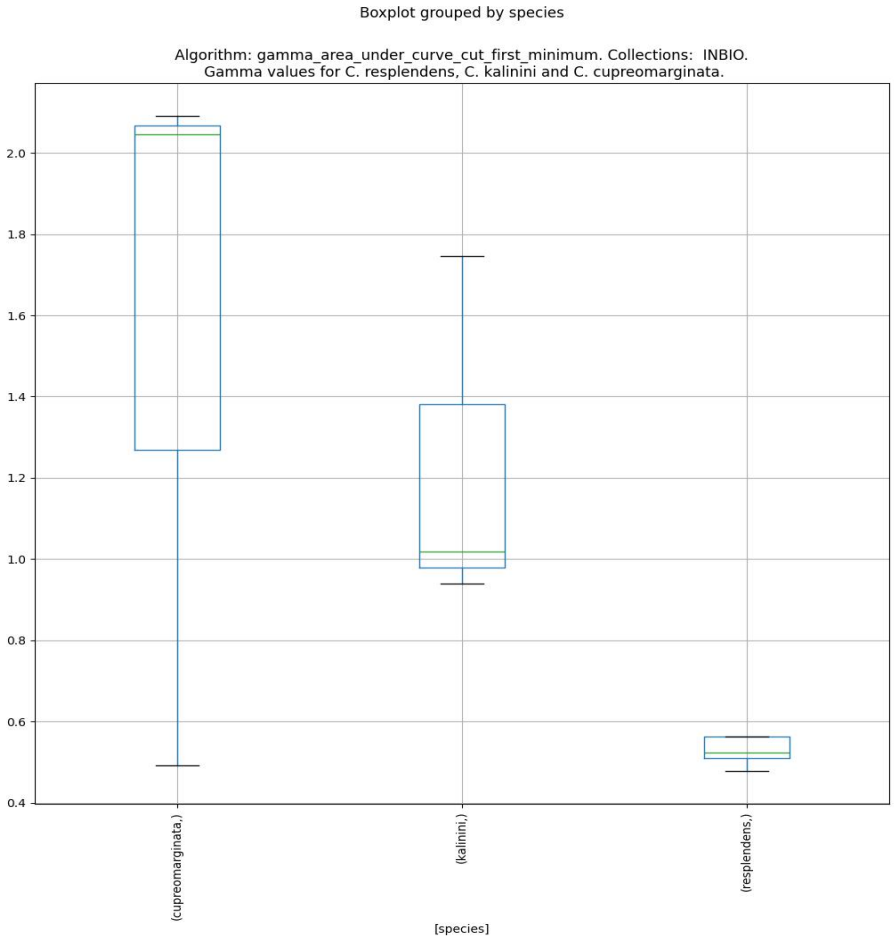
Assuming each species is distributed normally: Differentiable species are: ['kalinini']. 75.0% of these specimens will be found in a region in which the probability of being a specimen of other species is less than 25.0 %.

Algorithm description: gamma_area_under_curve_cut_first_minimum

This algorithm calculates the area for the visible region (starting at 450 and ending in the first minima between the maximum in the visible range and the maximum in the IR range. Then calculates the area of the IR range up to the second minumum. The ratio between these two areas is the gamma value.

Results

Gamma boxplot for gamma_area_under_curve_cut_first_minimum



Differentiable species:

Assuming each species is distributed normally: Differentiable species are: ['resplendens']. 75.0% of these specimens will be found in a region in which the probability of being a specimen of other species is less than 25.0 %.

Similarity Index:

For each spectrum a similarity index is calculated which is the sum of the squared differences between the wavelength peak values of the unknown sample and the average wavelength peak values for each species.

Test results:

The reported(correct) species is compared with the species with the lowest similarity index (si), the final column (test_result) shows if the species coincide:

The amount of correct guesses is 21 out of 63

The accuracy (Percentage of correct classifications out of total classifications) is 33.33 %

For kalinini, precision (correct classifications out of all classifications for this species) is 33.33 % and recall (out of the actual specimens for this species how many were correctly classified) is 100.00 %.
For resplendens, precision is nan % and recall is 0.00 %.
For cupreomarginata, precision is nan % and recall is 0.00 %.

code	species	kali_si	cupr_si	resp_si	prediction
1037298	cupreomarginata	135.335	160.567	154.76	kalinini
1037299	cupreomarginata	162.694	187.926	182.119	kalinini
1037308	resplendens	135.279	161.44	147.304	kalinini
1037312	resplendens	135.707	160.939	155.132	kalinini
1054219	cupreomarginata	137.535	163.696	150.924	kalinini
1309367	resplendens	155.414	180.646	174.839	kalinini
1717606	kalinini	131.411	157.572	150.788	kalinini
1736458	kalinini	163.75	188.982	183.175	kalinini
1736459	kalinini	162.117	187.349	181.542	kalinini
209836	kalinini	131.985	158.146	151.362	kalinini
2181994	resplendens	132.067	158.228	149.047	kalinini
2195354	kalinini	135.094	161.255	147.119	kalinini
2195355	kalinini	134.415	160.575	146.44	kalinini
2195357	kalinini	134.913	161.074	148.985	kalinini
2195358	kalinini	135.348	161.509	147.373	kalinini
2234738	kalinini	163.359	188.591	182.784	kalinini
2248544	cupreomarginata	133.041	159.202	150.022	kalinini
2249504	cupreomarginata	136.349	161.582	155.774	kalinini

2249505	cupreomarginata	134.526	160.686	153.389	kalinini
2253302	cupreomarginata	155.219	180.451	174.644	kalinini
2361339	cupreomarginata	136.875	162.107	156.3	kalinini
2375565	cupreomarginata	166.278	191.51	185.703	kalinini
2376856	cupreomarginata	137.018	162.25	156.443	kalinini
2376857	cupreomarginata	158.634	183.866	178.059	kalinini
2388550	cupreomarginata	162.934	188.166	182.359	kalinini
2388554	cupreomarginata	130.717	156.877	149.922	kalinini
2422833	cupreomarginata	137.148	162.38	156.573	kalinini
2422834	cupreomarginata	132.695	157.927	152.12	kalinini
2452030	cupreomarginata	135.972	161.204	155.397	kalinini
2453057	cupreomarginata	136.022	161.254	155.447	kalinini
2456006	kalinini	136.341	162.502	148.366	kalinini
2467329	cupreomarginata	162.867	188.099	182.292	kalinini
2548659	kalinini	152.191	177.423	171.616	kalinini
3036568	kalinini	164.314	189.546	183.739	kalinini
3045302	kalinini	135.242	161.402	149.485	kalinini
3102408	kalinini	152.735	177.967	172.16	kalinini
3102412	kalinini	162.424	187.656	181.849	kalinini
3169943	kalinini	162.711	187.943	182.136	kalinini
3353565	resplendens	155.066	180.298	174.491	kalinini
3359158	resplendens	155.569	180.802	174.994	kalinini
353553	kalinini	131.177	157.338	150.383	kalinini
3708178	resplendens	154.508	179.74	173.933	kalinini
3710592	resplendens	133.784	159.016	153.209	kalinini
3720411	resplendens	132.786	158.018	152.211	kalinini
3731054	resplendens	133.114	158.346	152.539	kalinini
4090505	resplendens	132.806	158.038	152.231	kalinini
4090508	resplendens	130.563	156.724	147.715	kalinini
4146715	cupreomarginata	166.507	191.739	185.932	kalinini
419121	resplendens	129.405	155.566	148.611	kalinini
4224244	resplendens	131.296	157.457	150.673	kalinini
4224249	resplendens	133.024	159.185	150.176	kalinini
4249297	resplendens	135.657	160.889	155.082	kalinini
4294666	resplendens	159.196	184.428	178.621	kalinini

4298666	cupreomarginata	133.692	159.215	153.117	kalinini
532145	cupreomarginata	133.629	159.789	152.492	kalinini
532146	cupreomarginata	132.781	158.476	152.206	kalinini
623604	resplendens	130.59	156.751	147.913	kalinini
668621	resplendens	132.68	157.912	152.105	kalinini
714869	kalinini	134.639	159.871	154.064	kalinini
714947	kalinini	163.817	189.049	183.242	kalinini
776563	kalinini	158.376	183.608	177.801	kalinini
856696	resplendens	158.313	183.546	177.738	kalinini
987517	kalinini	136.474	161.706	155.899	kalinini

Peak_Ratio_And_Wavelength_Similarity_Index:

This algorithm calculates the square difference for wavelength and the square difference in gamma values and multiplies them. Lower values are for spectra that has similar wavelengths and similar gamma values with respect to known spectra

Test results:

The reported(correct) species is compared with the species with the lowest similarity index (si), the final column (test_result) shows if the species coincide:

The amount of correct guesses is 25 out of 54

The accuracy (Percentage of correct classifications out of total classifications) is 46.30 %

For kalinini, precision (correct classifications out of all classifications for this species) is 43.48 % and recall (out of the actual specimens for this species how many were correctly classified) is 47.62 %.
For resplendens, precision is nan % and recall is 0.00 %.
For cupreomarginata, precision is 48.39 % and recall is 68.18 %.

code	species	cupreomarginata	kalinini	resplendens	prediction
1037298	cupreomarginata	10.856	32.949	16.681	cupreomarginata
1037299	cupreomarginata	611.307	282.562	500.238	kalinini
1037308	resplendens	nan	nan	nan	nan
1037312	resplendens	1.899	17.639	5.174	cupreomarginata
1054219	cupreomarginata	19.281	44.127	25.165	cupreomarginata
1309367	resplendens	497.177	220.431	402.99	kalinini
1717606	kalinini	nan	nan	nan	nan
1736458	kalinini	712.092	338.895	586.715	kalinini
1736459	kalinini	512.151	228.044	415.476	kalinini
209836	kalinini	3.15	19.98	6.926	cupreomarginata
2181994	resplendens	nan	nan	nan	nan
2195354	kalinini	nan	nan	nan	nan
2195355	kalinini	0.521	13.351	2.586	cupreomarginata
2195357	kalinini	nan	nan	nan	nan
2195358	kalinini	0.12	11.311	1.603	cupreomarginata
2234738	kalinini	649.046	303.536	532.572	kalinini
2248544	cupreomarginata	14.913	37.914	20.828	cupreomarginata
2249504	cupreomarginata	9.386	30.989	14.972	cupreomarginata
2249505	cupreomarginata	5.963	25.371	10.648	cupreomarginata

2253302	cupreomarginata	240.642	86.94	186.383	kalinini
2361339	cupreomarginata	16.747	41.0	23.455	cupreomarginata
2375565	cupreomarginata	669.697	314.903	550.183	kalinini
2376856	cupreomarginata	11.999	34.789	18.061	cupreomarginata
2376857	cupreomarginata	633.917	295.387	519.776	kalinini
2388550	cupreomarginata	397.062	166.154	317.575	kalinini
2388554	cupreomarginata	21.245	45.225	28.006	cupreomarginata
2422833	cupreomarginata	12.581	35.604	18.738	cupreomarginata
2422834	cupreomarginata	19.872	44.109	26.762	cupreomarginata
2452030	cupreomarginata	15.785	39.628	22.346	cupreomarginata
2453057	cupreomarginata	13.169	36.22	19.379	cupreomarginata
2456006	kalinini	nan	nan	nan	nan
2467329	cupreomarginata	632.034	294.078	517.999	kalinini
2548659	kalinini	354.238	144.688	281.84	kalinini
3036568	kalinini	663.604	311.618	545.031	kalinini
3045302	kalinini	3.717	21.464	7.509	cupreomarginata
3102408	kalinini	228.7	81.35	176.552	kalinini
3102412	kalinini	586.678	268.935	479.156	kalinini
3169943	kalinini	564.649	256.757	460.295	kalinini
3353565	resplendens	549.24	248.832	447.432	kalinini
3359158	resplendens	678.142	320.216	557.829	kalinini
353553	kalinini	8.484	28.856	13.675	cupreomarginata
3708178	resplendens	469.525	205.558	379.478	kalinini
3710592	resplendens	15.698	39.152	22.174	cupreomarginata
3720411	resplendens	10.396	31.925	16.069	cupreomarginata
3731054	resplendens	17.705	41.549	24.388	cupreomarginata
4090505	resplendens	11.843	33.933	17.755	cupreomarginata
4090508	resplendens	9.102	29.672	14.195	cupreomarginata
4146715	cupreomarginata	595.739	273.641	486.742	kalinini
419121	resplendens	13.871	35.979	19.846	cupreomarginata
4224244	resplendens	nan	nan	nan	nan
4224249	resplendens	nan	nan	nan	nan
4249297	resplendens	1.308	16.084	4.215	cupreomarginata
4294666	resplendens	646.046	302.113	530.158	kalinini
4298666	cupreomarginata	18.987	43.177	25.788	cupreomarginata

532145	cupreomarginata	11.456	33.436	17.19	cupreomarginata
532146	cupreomarginata	9.467	30.558	14.939	cupreomarginata
623604	resplendens	nan	nan	nan	nan
668621	resplendens	9.647	30.842	15.182	cupreomarginata
714869	kalinini	5.576	24.792	10.24	cupreomarginata
714947	kalinini	647.556	302.674	531.276	kalinini
776563	kalinini	419.315	178.368	336.648	kalinini
856696	resplendens	661.778	310.941	543.688	kalinini
987517	kalinini	0.312	12.593	2.26	cupreomarginata

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